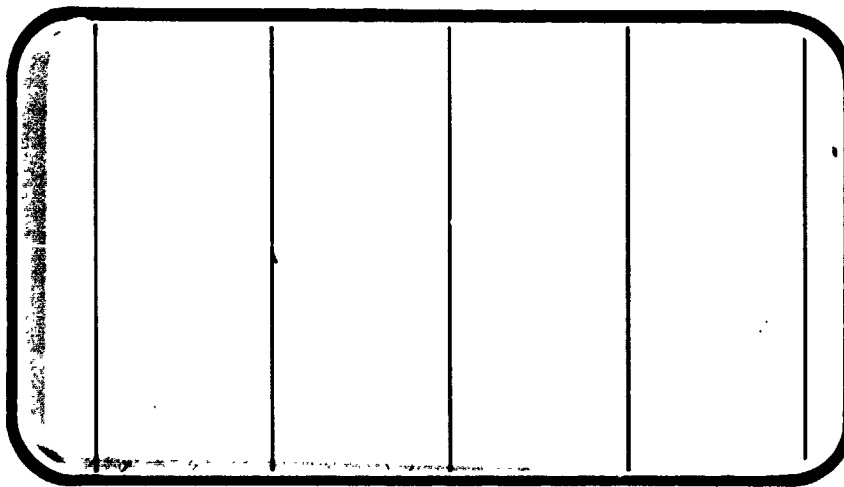




NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

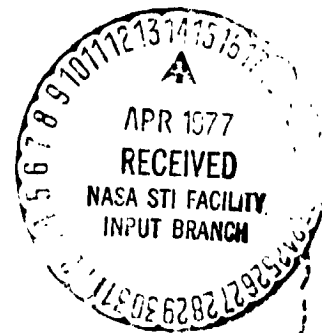


(NASA-CR-151062) SUPERSONIC CONTROL
EFFECTIVENESS FOR FULL AND PARTIAL SPAN
ELEVON CONFIGURATIONS ON A 0.0165 SCALE
MODEL SPACE SHUTTLE ORBITER TESTED IN THE
LARC UNITARY PLAN WIND TUNNEL (Chrysler

N77-20147
HC A06/MF A01
Unclas
G3/16 22842

SPACE SHUTTLE

AEROTHERMODYNAMIC DATA REPORT



JOHNSON SPACE CENTER

HOUSTON, TEXAS

DATA Management services

SPACE DIVISION



CHRYSLER
CORPORATION

March 1977

DMS-DR-2182
NASA CR-151,062

SUPERSONIC CONTROL EFFECTIVENESS FOR FULL AND
PARTIAL SPAN ELEVON CONFIGURATIONS ON A 0.0165
SCALE MODEL SPACE SHUTTLE ORBITER TESTED IN
THE LaRC UNITARY PLAN WIND TUNNEL (LA49)

Prepared under NASA Contract Number NAS9-13247

by

Data Management Services
Chrysler Corporation Michoud Defense-Space Division
New Orleans, La. 70189

for

Engineering Analysis Division

Johnson Space Center
National Aeronautics and Space Administration
Houston, Texas

WIND TUNNEL TEST SPECIFICS:

Test Number: LaRC UPWT (Leg 2) 1101
NASA Series Number: LA49
Model Number: 089B-139
Test Dates: April 24 through 26, 1974
Occupancy Hours: 30

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SUPERSONIC CONTROL EFFECTIVENESS FOR FULL AND
PARTIAL SPAN ELEVON CONFIGURATIONS ON A 0.0165
SCALE MODEL SPACE SHUTTLE ORBITER TESTED IN
THE LARC UNITARY PLAN WIND TUNNEL (LA49)

ABSTRACT

An experimental investigation has been conducted in the NASA-Langley Research Center Unitary Plan Wind Tunnel (Lap 2) on an early version of the space shuttle orbiter (designated O89B-139) 0.0165 scale model to systematically determine both longitudinal and lateral control effectiveness associated with various combinations of inboard, outboard, and full span wing trailing edge controls. This report presents results from supersonic investigations conducted from April 24 through 26, 1974. The test Mach numbers were 2.5 and 4.63 over an angle of attack range from -4° to 4° at 0° sideslip.

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PLOTTED COEFFICIENTS SCHEDULE:

- A) CL, CLM, CD, L/D versus ALPHA
- B) CLM versus ELEVTR, DCL/DE, DCD/DE, DCLMDE versus ALPHA
- C) CLM versus ELV-LI, DCL/DE, DCD/DE, DCLMDE versus ALPHA
- D) CLM versus ELV-LO, DCL/DE, DCD/DE, DCLMDE versus ALPHA
- E) DCL/DE, DCD/DE, DCLMDE versus ALPHA
- F) DCY/DA, DCYNDA, DCBLDA versus ALPHA
- G) DCMIDE, DCLMDE, DCMI/F versus ALPHA
- H) DCMODE, DCLMDE, DCMO/F

NOMENCLATURE
General

<u>SYMBOL</u>	<u>ALPHANUMERIC</u>	<u>DEFINITION</u>
a		speed of sound; m/sec, ft/sec
C _p	CP	pressure coefficient; $(p_1 - p_\infty)/q$
M	MACH	Mach number; V/a
P		pressure; N/m ² , psf
q	Q(NSM) Q(PSF)	dynamic pressure; $1/2\rho V^2$, N/m ² , psf
RN/L	RN/L	unit Reynolds number; per m, per ft
V		velocity; m/sec, ft/sec
α	ALPHA	angle of attack, degrees
β	BETA	angle of sideslip, degrees
ψ	PSI	angle of yaw, degrees
ϕ	PHI	angle of roll, degrees
ρ		mass density; kg/m ³ , slugs/ft ³

Reference & C.G. Definitions

A _b		base area; m ² , ft ²
b	BREF	wing span or reference span; m, ft
c.g.		center of gravity
\bar{l}_{REF} \bar{c}	LREF	reference length or wing mean aerodynamic chord; m, ft
S	SREF	wing area or reference area; m ² , ft ²
	MRP	moment reference point
	XMRP	moment reference point on X axis
	YMRP	moment reference point on Y axis
	ZMRP	moment reference point on Z axis

SUBSCRIPTS

b	base
l	local
s	static conditions
t	total conditions
∞	free stream

NOMENCLATURE (Continued)

Body-Axis System

<u>SYMBOL</u>	<u>MNEMONIC</u>	<u>DEFINITION</u>
C_N	CN	normal-force coefficient; $\frac{\text{normal force}}{qS}$
C_A	CA	axial-force coefficient; $\frac{\text{axial force}}{qS}$
C_Y	CY	side-force coefficient; $\frac{\text{side force}}{qS}$
C_{A_b}	CAB	base-force coefficient; $\frac{\text{base force}}{qS}$ $-A_b(p_b - p_\infty)/qS$
C_{A_f}	CAF	forebody axial force coefficient, $C_A - C_{A_b}$
C_m	CIM	pitching-moment coefficient; $\frac{\text{pitching moment}}{qS_{REF}}$
C_n	CYN	yawing-moment coefficient; $\frac{\text{yawing moment}}{qSb}$
C_l	CBL	rolling-moment coefficient; $\frac{\text{rolling moment}}{qSb}$

Stability-Axis System

C_L	CL	lift coefficient; $\frac{\text{lift}}{qS}$
C_D	CD	drag coefficient; $\frac{\text{drag}}{qS}$
C_{D_b}	CDB	base-drag coefficient; $\frac{\text{base drag}}{qS}$
C_{D_f}	CDF	forebody drag coefficient; $C_D - C_{D_b}$
C_Y	CY	side-force coefficient; $\frac{\text{side force}}{qS}$
C_m	CLM	pitching-moment coefficient; $\frac{\text{pitching moment}}{qS_{REF}}$
C_n	CLN	yawing-moment coefficient; $\frac{\text{yawing moment}}{qSb}$
C_l	CSL	rolling-moment coefficient; $\frac{\text{rolling moment}}{qSb}$
L/D	L/D	lift-to-drag ratio; C_L/C_D
L/D_f	L/DF	lift to forebody drag ratio; C_L/C_{D_f}

NOMENCLATURE (Continued)

<u>SYMBOL</u>	<u>MNEMONIC</u>	<u>DEFINITION</u>
$C_{D\delta_e}$	DCD/DE	Slope of drag coefficient vs. elevon deflection curve; $dC_D/d\delta_e$, per degree
$C_{L\delta_e}$	DCL/DE	Slope of lift coefficient vs. elevon deflection curve; $dC_L/d\delta_e$, per degree
C_{l_a}	DCBLDA	Slope of rolling moment coefficient vs. aileron deflection curve, $dC_l/d\delta_a$, per degree
$C_{m\delta_e}$	DCLMDE	Slope of pitching moment coefficient vs elevon deflection curve, $dC_m/d\delta_e$, per degree
$C_{Y\delta_a}$	DCY/DA	Slope of side force coefficient vs. aileron deflection curve, $dC_Y/d\delta_a$, per degree
$C_{n\delta_a}$	DCYNDA	Slope of yawing moment coefficient vs. aileron deflection curve, $dC_n/d\delta_a$, per degree
δ_a	AILRON	Aileron deflection angle; elevon deflection for roll control, $(\delta_{aL} - \delta_{aR})/2$, positive deflection left panel trailing edge down.
δ_e	ELEVTR	Elevator deflection angle; elevon deflection for pitch control $(\delta_{eL} + \delta_{eR})/2$, positive deflection trailing edge down
δ_{eL_O}	ELV-LO	Left outboard elevon panel deflection, degrees
δ_{eL_I}	ELV-LI	Left inboard elevon panel deflection, degrees
δ_{eR_I}	ELV-RI	Right inboard elevon panel deflection, degrees
δ_{eR_O}	ELV-RO	Right outboard elevon panel deflection, degrees
$C_{m\delta_{eI}}$	DCMIDE	Slope of pitching moment coefficient versus inboard elevon deflection curve, per degree

NOMENCLATURE (Concluded)

<u>SYMBOL</u>	<u>MEMORIC</u>	<u>DEFINITION</u>
$C_{m\delta_{e_o}}$	DCMODE	Slope of pitching moment coefficient versus outboard elevon deflection curve, per degree.
	DCMI/F	Ratio of the slopes of the inboard elevon pitching moment curve over the full span elevon pitching moment curve.
	DCMO/F	Ratio of the slopes of the outboard elevon pitching moment curve over the full span elevon pitching moment curve.
δ_{SB}	SPDBRK	speed brake deflection angle, degrees
δ_{BF}	BDFLAP	body flap deflection angle, degrees

INTRODUCTION

As a continuing effort to identify the most suitable space shuttle concept, a joint study between Langley Research Center, Johnson Space Center, and Rockwell International has been undertaken to determine if the independent operation of the four elevator surfaces of the orbiter could result in a more efficient use of available control power, reduced elevator hinge moments, and associated aeroelastic wing bending, or allow a more flexible flight profile without adverse control characteristics.

Therefore, an experimental investigation at subsonic and supersonic speeds was initiated at Langley to systematically determine both longitudinal and lateral control effectiveness associated with various combinations of inboard, outboard, and full span wing trailing edge controls for a shuttle orbiter configuration. Due to the unavailability of a current vehicle model, the model employed in this study was an 0.0165 scale earlier version of the orbiter designated by Rockwell International as configuration 089B-139. The differences between this configuration and the current design (vehicle 5) were not felt to be sufficient to alter the incremental effectiveness presented herein. This report presents the initial supersonic results obtained in the overall study. Utilizing the Langley Unitary Plan Wind Tunnel, the Mach numbers of the investigation were 2.5 and 4.63. Angle of attack was varied from about -4° to as much as 42° at 0° of sideslip. Transonic results are presented in the reference.

CONFIGURATIONS INVESTIGATED

The configuration tested was a 0.0165 scale model of a blend of Rockwell International Shuttle configurations consisting of a 089B configuration with a 139B configuration nose forward of fuselage station 500. A sketch and photographs of the model are shown in figures 2 and 3, respectively. Body base flap was fixed at 0° deflection.

Elevon controls were split at 0.60 b/2 giving the inboard and outboard segments approximately 53 percent and 47 percent of the total elevon area, respectively. The surfaces could be deflected in unison or as individual panels. Maximum range of deflection for each panel was from 0° to -40° . Combinations tested included: for pitch control, inboards only, outboards only and full span; for roll control, outboards, only with full span and inboard deflected for pitch control.

To expedite testing, the elevons were remotely controlled by four internal electric motors (see fig. 2c).

A complete description of model dimensional data is given in table III.

TEST CONDITIONS

The model was sting supported, with aerodynamic forces and moments measured by an internally mounted six-component strain gage balance. Model angle of attack was varied from about -4° to as much as 42° at an angle of sideslip of 0° . Reynolds number was constant at a nominal 2.0×10^6 per foot. Angle of attack has been corrected for deflection of the sting and balance under load.

Transition strips 0.16 cm wide composed of No. 60 sand grit were located 1.0 inch aft of the apex of the fuselage and 0.5 inch (measured streamwise) aft of the wing and fillet and vertical tail leading edges.

Drag data presented herein represent gross drag in that measured drag is uncorrected for base pressure effects.

TEST FACILITY DESCRIPTION

The NASA LARC 4 foot Unitary Plan Wind Tunnel (UPWT) is a closed-circuit continuous flow, variable density facility. The test section is 4 feet by 4 feet by 7 feet long.

Two tunnel legs are available for supersonic testing in the Mach number ranges 1.47 to 2.86 (Leg No. 1) and 2.29 to 4.63 (Leg No. 2). Leg No. 2 was used for this test. An asymmetric, sliding block nozzle position and total pressure setting provide the test Mach numbers at a specified Reynolds number. Reynolds number can be varied from 0.76 to 7.78 million per foot. Available stagnation pressure variation is 4.0 to 142 psia. Dynamic pressure variation is 95 to 1260 psf with normal operating stagnation temperature about 150°F in Mach modes 2 or 3 and about 175°F in Mach mode 4. The tunnel is equipped with a dry air supply, an evacuating system, and a cooling system. The facility power is approximately 83,000 horsepower.

Model mounting provisions consist of various sting arrangements, including axial (longitudinal), lateral (independent pitch and yaw), and roll movement with side wall support. A Schlieren system and oil flow visualization equipment are available. Data are recorded at the tunnel and reduced off-line at the Langley Computer Center. The tunnel is used for force and moment, pressure, and dynamic stability tests. Hot and cold jet effects and heat transfer have been studied in the UPWT.

DATA REDUCTION

Data was recorded at the facility and reduced off-line at the LaRC Computation Center. Longitudinal data are referred to the stability-axis system and lateral-directional data are referred to the body-axis system. All coefficients are normalized with respect to the projected wing area (excluding the fillet), mean aerodynamic chord or span, which are:

SPEF = wing projected area = 0.732 ft.^2

LREF = wing mean aerodynamic chord = 7.834 in.

BREF = wing span = 15.45 in.

All data are presented along a set of body and stability axes (Figure 1) passing through the estimated forward center of gravity located at a full scale fuselage station of 1076.48 in. or 65% of the actual body length.

Elevon and aileron derivative data were computer-generated by the Chrysler DATAMAN-CADGAC Program and represent the local slope of the coefficient vs. control deflection at each value of angle of attack.

REFERENCE

DMS-DR-2184, "TRANSONIC CONTROL EFFECTIVENESS FOR FULL AND PARTIAL SPAN
ELEVON CONFIGURATIONS ON A 0.0165 SCALE MODEL SPACE SHUTTLE ORBITER TESTED
IN THE LaRC 8-FOOT TRANSONIC PRESSURE TUNNEL (LA48)."

TABLE I

[illegible]

TABLE III
MODEL DIMENSIONAL DATA

MODEL COMPONENT : BODY - B20

GENERAL DESCRIPTION : 089B-139B (MODIFIED NOSE), NOSE SECTION FROM
FULL-SCALE STATION 238, 0 TO STATION 500 FROM NAR DRAWING VL70-000139B.
REMAINING BODY AFT OF STATION 500 FROM NAR VL70-000093.

MODEL SCALE 0.0165

DRAWING NUMBER : VL70-000093, VL70-000139B

DIMENSIONS :	FULL SCALE	MODEL SCALE
Length	<u>1290.3 IN.</u>	<u>21.200 IN.</u>
Max Width	<u>265.0</u>	<u>4.372 IN.</u>
Max Depth	<u>248.0</u>	<u>4.092 IN.</u>
Fineness Ratio	<u>4.869</u>	<u>4.869 IN.</u>
Area	<u>156.4000 SQ. FT.</u>	<u>17.8927 SQ. FT.</u>
Max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>

TABLE III (Continued)
MODEL DIMENSIONAL DATA

MODEL COMPONENT : BODY FLAP-F1

GENERAL DESCRIPTION : OB9B-139

MODEL SCALE: 0.0165

DRAWING NUMBER : VL70-000094A

DIMENSIONS :	FULL SCALE	MODEL SCALE
Length	<u>84.700</u>	<u>1.398</u>
Max Width	<u>265.000</u>	<u>4.372</u>
Max Depth	<u>21.000</u>	<u>.346</u>
Fineness Ratio	<u></u>	<u></u>
Area	<u></u>	<u></u>
Max. Cross-Sectional	<u></u>	<u></u>
Planform	<u>142.6400</u>	<u>5.5921</u>
Wetted	<u></u>	<u></u>
Base	<u>38.0460</u>	<u>1.5151</u>

TABLE III (Continued)
MODEL DIMENSIONAL DATA

MODEL COMPONENT : ONE PODS - M¹⁴

GENERAL DESCRIPTION 032B-132

MODEL SCALE: 0.0165

DRAWING NUMBER : V170-000094

DIMENSIONS :

	FULL SCALE	MODEL SCALE
Length	346.000	5.709
Max Width	108.000	1.782
Max Depth	113.800	1.878
Fineness Ratio		
Area		
Max. Cross-Sectional		
Planform		
Wetted		
Base		

ONE POD CHARACTERISTICS

Y Axis Orbits

463.000

7.651

Z Axis Orbits

90.000

1.320

TABLE III (Continued)
MODEL DIMENSIONAL DATA

COMPONENT SLOTTED ELEVON (6-inch GAP) - B43

GENERAL DESCRIPTION Configuration 140A/D Orbiter elevon.

NOTE: B43 is a slotted version of B26. Data are for one side.

MODEL SCALE: 0.0165 MODEL DRAWING: WG-A00149

DRAWING NUMBER _____

DIMENSIONS	FULL SCALE	MODEL SCALE
Area - Ft ²	<u>210.0</u>	<u>0.0572</u>
Span (equivalent) - In.	<u>349.2</u>	<u>5.762</u>
Inb'd equivalent chord - In.	<u>119.004</u>	<u>1.947</u>
Outb'd equivalent chord/ total surface chord	<u>55.124</u>	<u>0.9100</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u>0.2006</u>	<u>0.2306</u>
At Outb'd equiv. chord	<u>0.4004</u>	<u>0.4404</u>
Sweep Back Angles, degrees		
Leading Edge	<u>0.00</u>	<u>0.00</u>
Trailing Edge	<u>-10.056</u>	<u>-10.056</u>
Hingeline	<u>0.00</u>	<u>0.00</u>
Area Moment (Normal to hinge line)	<u>1587.0</u>	<u>0.0013</u>
Mean Aerodynamic Chord (\bar{c}), in.	<u>21.7</u>	<u>1.406</u>

TABLE III (Continued)
MODEL DIMENSIONAL DATA

MODEL COMPONENT WIDYER - R5

GENERAL DESCRIPTION CONFIGURATION FIVE LINE V170-000025.

MODEL SCALE: 0.0167

DRAWING NUMBER V170-000025

DIMENSIONS	FULL SCALE	MODEL SCALE
Area	<u>106.380 SQ. FT.</u>	<u>.0220 SQ. FT.</u>
Span (equivalent)	<u>261.00 IN.</u>	<u>3.39 IN.</u>
Inb'd equivalent chord	<u>21.585 IN.</u>	<u>1.51 IN.</u>
Outb'd equivalent chord	<u>50.933 IN.</u>	<u>.94 IN.</u>
Ratio movable surface chord/ total surface chord	<u> </u>	<u> </u>
At Inb'd equiv. chord	<u>.400</u>	<u>.400</u>
At Outb'd equiv. chord	<u>.400</u>	<u>.400</u>
Sweep Back Angles, degrees	<u> </u>	<u> </u>
Leading Edge	<u>34.83</u>	<u>34.83 DEG.</u>
Trailing Edge	<u>26.25</u>	<u>26.25 DEG.</u>
Hingeline	<u>34.83</u>	<u>34.83 DEG.</u>
Area Moment (Normal to hinge line)	<u>506.1250 IN. IN.</u>	<u>4.0840 IN. IN.</u>

TABLE III (Continued)
MODEL DIMENSIONAL DATA

MODEL COMPONENT VERTICAL TAIL - V₅

GENERAL DESCRIPTION CENTERLINE VERTICAL TAIL DOUBLE WEDGE AIRFOIL
WITH ROUGHED LEADING EDGE.

MODEL SCALE: 0.0165

DRAWING NUMBER VL70-000025

DIMENSIONS	FULL SCALE	MODEL SCALE
Area	<u>413.2500 SQ. FT.</u>	<u>16.2011 SQ. IN.</u>
Span (equivalent)	<u>315.72</u>	<u>5.21 IN.</u>
Inb'd equivalent chord	<u>268.50 IN.</u>	<u>4.43 IN.</u>
Outb'd equivalent chord	<u>108.47 IN.</u>	<u>1.79 IN.</u>
Ratio movable surface chord/ total surface chord	<u> </u>	<u> </u>
At Inb'd equiv. chord	<u> </u>	<u> </u>
At Outb'd equiv. chord	<u> </u>	<u> </u>
Sweep Back Angles, degrees	<u> </u>	<u> </u>
Leading Edge	<u>45.00 DEG.</u>	<u>45.00 DEG.</u>
Trailing Edge	<u>26.242 DEG.</u>	<u>26.25 DEG.</u>
Hingeline	<u> </u>	<u> </u>
Area Moment (Normal to hinge line)	<u> </u>	<u> </u>

TABLE III (Cont'd)

MODEL COMPONENT: WING - 1/2

GENERAL DESCRIPTION: CONVENTIONAL WING SECTION, 1/2 INCH THICK, 1/2 INCH CHORD, 1/2 INCH SPAN, 1/2 INCH ASPECT RATIO, 1/2 INCH TAPER RATIO, 1/2 INCH DIHEDRAL ANGLE, 1/2 INCH INCIDENCE ANGLE, 1/2 INCH AERODYNAMIC TWIST, 1/2 INCH TOE-IN ANGLE, 1/2 INCH CANT ANGLE, 1/2 INCH SWEEP BACK ANGLE, 1/2 INCH LEADING EDGE, 1/2 INCH TRAILING EDGE, 1/2 INCH 0.25 ELEMENT LINE, 1/2 INCH CHORDS, 1/2 INCH FUS. STA. OF .25 MAC, 1/2 INCH W.P. OF .25 MAC, 1/2 INCH B.L. OF .25 MAC, 1/2 INCH AIRFOIL SECTION, 1/2 INCH ROOT, 1/2 INCH TIP, 1/2 INCH EXPOSED DATA.

DRAWING NUMBER: W170-000003

DIMENSIONS:	FULL-SCALE	MODEL SCALE
<u>TOTAL DATA</u>		
Area		
Planform	2620.0000 SQ. IN.	105.4000 SQ. IN.
Wetted		
Span (equivalent)	26.000 IN.	15.000 IN.
Aspect Ratio	2.000	2.000
Rate of Taper	1.17	1.17
Taper Ratio	.600	.600
Dihedral Angle, degrees	3.500 DEG.	3.500 DEG.
Incidence Angle, degrees	5.000 DEG.	5.000 DEG.
Aerodynamic Twist, degrees	5.000 DEG.	5.000 DEG.
Toe-In Angle		
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge	45.000 DEG.	45.000 DEG.
Trailing Edge	-10.000 IN.	-10.000 IN.
0.25 Element Line	25.000 DEG.	25.000 DEG.
Chords:		
Root (Wing Sta. 0.0)	380.00 IN.	11.00 IN.
Tip, (equivalent)	130.00 IN.	4.00 IN.
MAC	120.00 IN.	3.00 IN.
Fus. Sta. of .25 MAC	110.00 IN.	1.00 IN.
W.P. of .25 MAC	20.00 IN.	.50 IN.
B.L. of .25 MAC		
Airfoil Section:		
Root		
Tip		
<u>EXPOSED DATA</u>		
Area	1550.0000 SQ. IN.	60.0000 SQ. IN.
Span, (equivalent)	15.000 IN.	11.000 IN.
Aspect Ratio	1.000	1.000
Taper Ratio	.600	.600
Chords		
Root	500.00 IN.	9.00 IN.
Tip	130.00 IN.	3.00 IN.
MAC	120.00 IN.	3.00 IN.
Fus. Sta. of .25 MAC	110.00 IN.	1.00 IN.
W.P. of .25 MAC	20.00 IN.	.50 IN.
B.L. of .25 MAC	10.00 IN.	.25 IN.

Notes:

1. Positive directions of force coefficients, moment coefficients, and angles are indicated by arrows
2. For clarity, origins of wind and stability axes have been displaced from the center of gravity

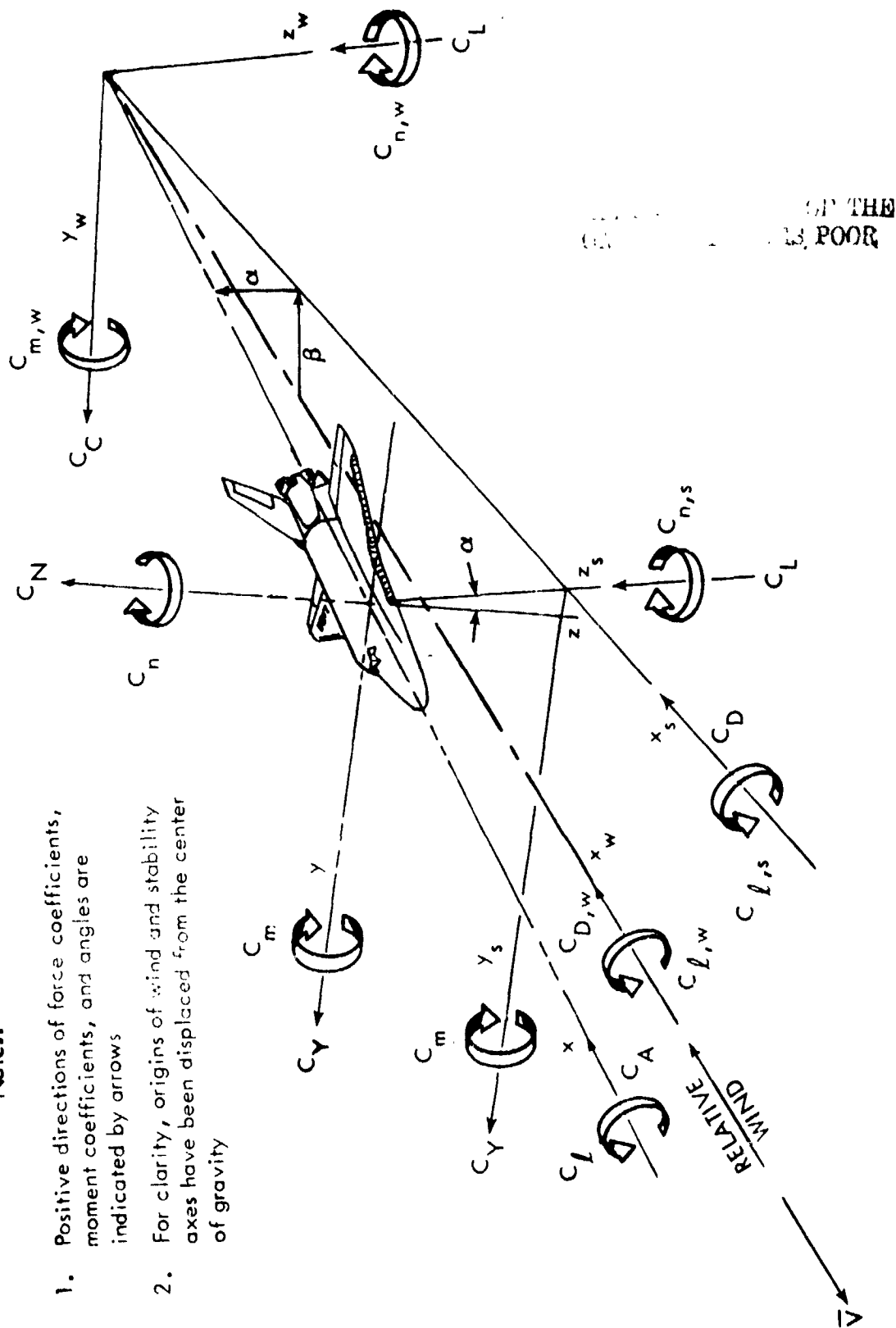
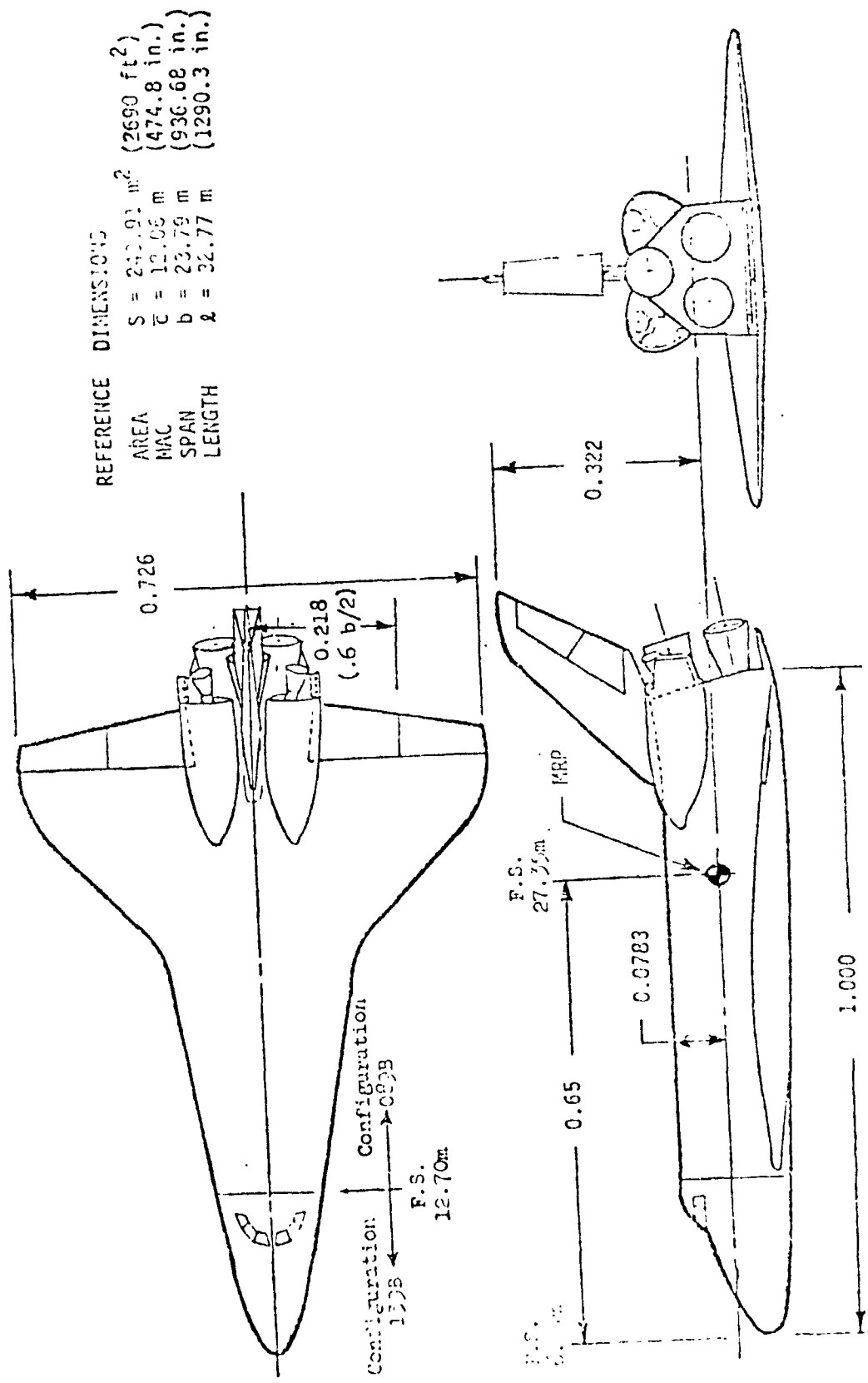
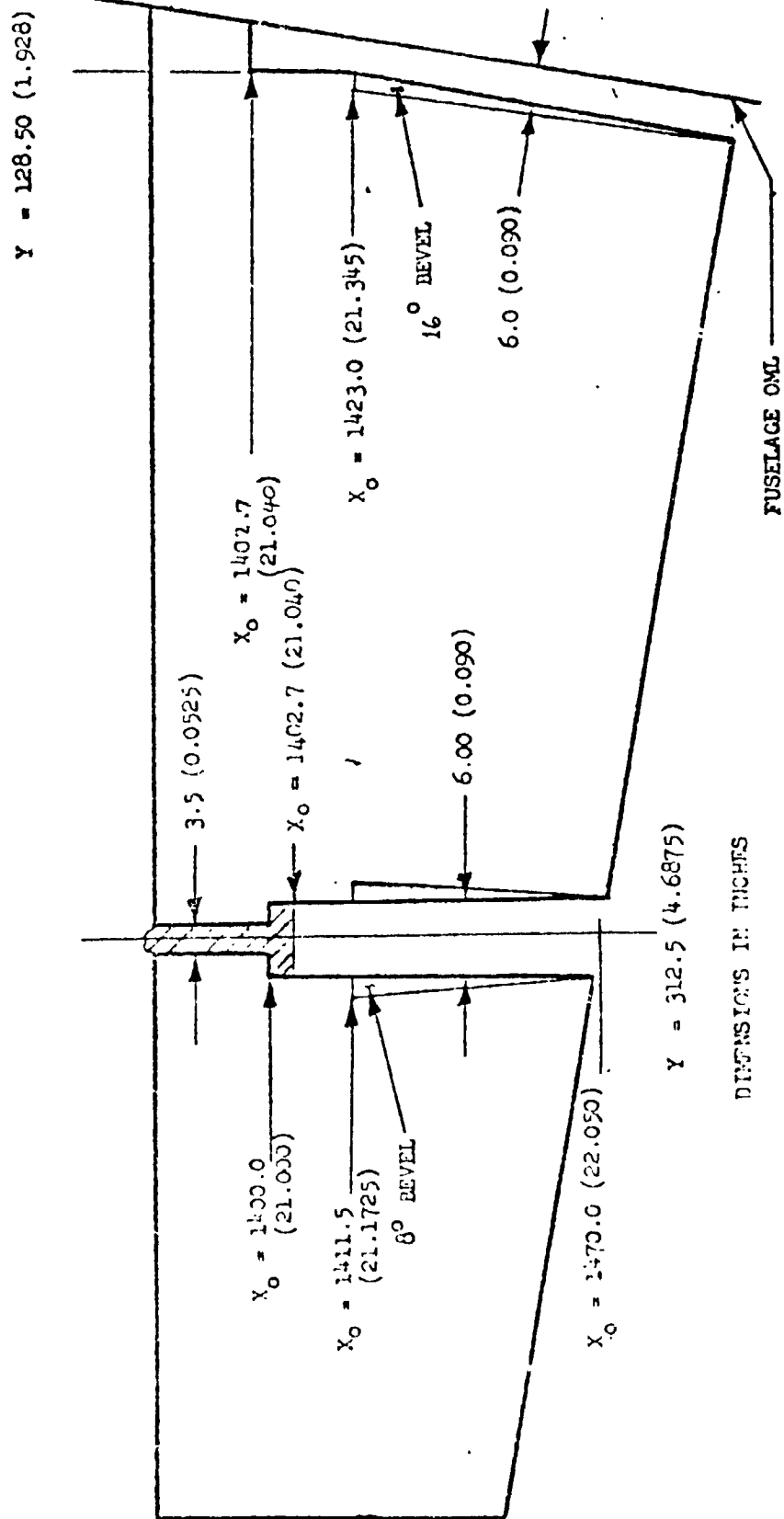


Figure 1. - Axis Systems



a. SSV Orbiter Configuration
Figure 2. - Model Sketches



b. Slotted Elevon E₄₃ (6-inch gap)
Figure 2. - Concluded.



a. Orbiter Configuration, Front, 3/4 View
Figure 3. - Model Photographs

REPRODUCTION OF THE
ORIGINAL IS POOR



b. Orbiter Configuration, Rear, 3/4 View
Figure 3. - Continued



c. View of Elevon Drive Motors
Figure 3. - Concluded

DATA FIGURES

DATA SET SYMBOL	CONFIGURATION	DESCRIPTION	ORB	SPLIT	ELEVON	ELV-L0	ELV-L1	ELV-R1	ELV-R0
[R-1001]	LA-49	UPWT 1101	RI-0898/139	ORB	SPLIT	ELEVON	.000	.000	.000
[R-1002]	LA-49	UPWT 1101	RI-0898/139	ORB	SPLIT	ELEVON	-10.000	-10.000	-10.000
[R-1003]	LA-49	UPWT 1101	RI-0898/139	ORB	SPLIT	ELEVON	-20.000	-20.000	-20.000
[R-1004]	LA-49	UPWT 1101	RI-0898/139	ORB	SPLIT	ELEVON	-40.000	-40.000	-40.000

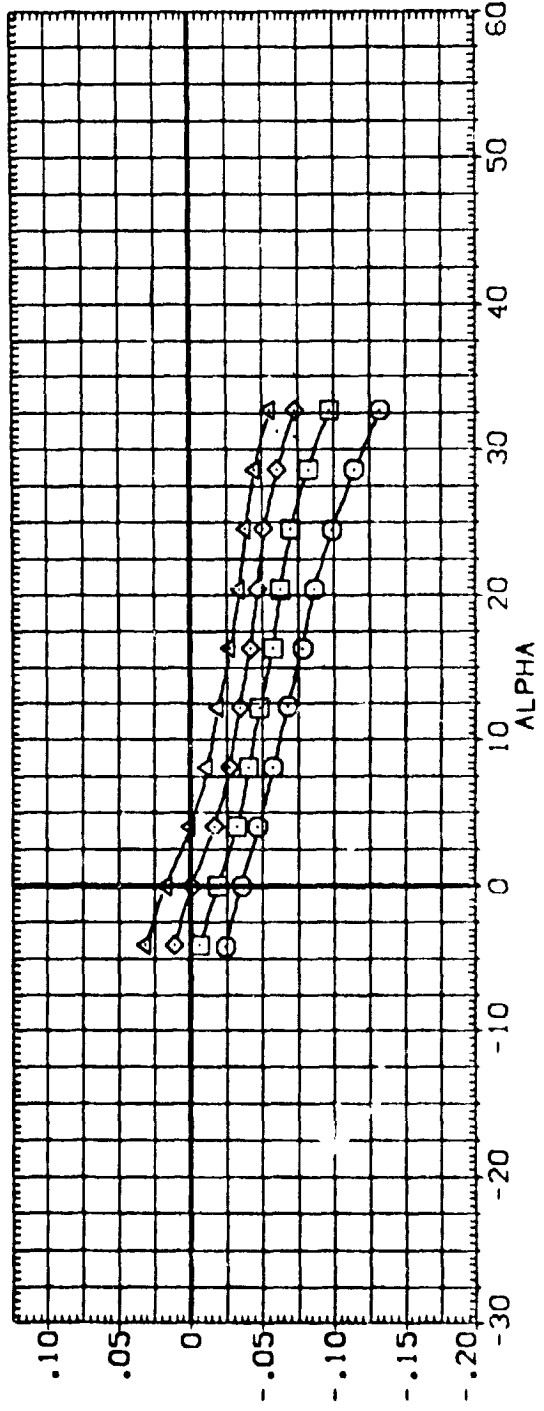
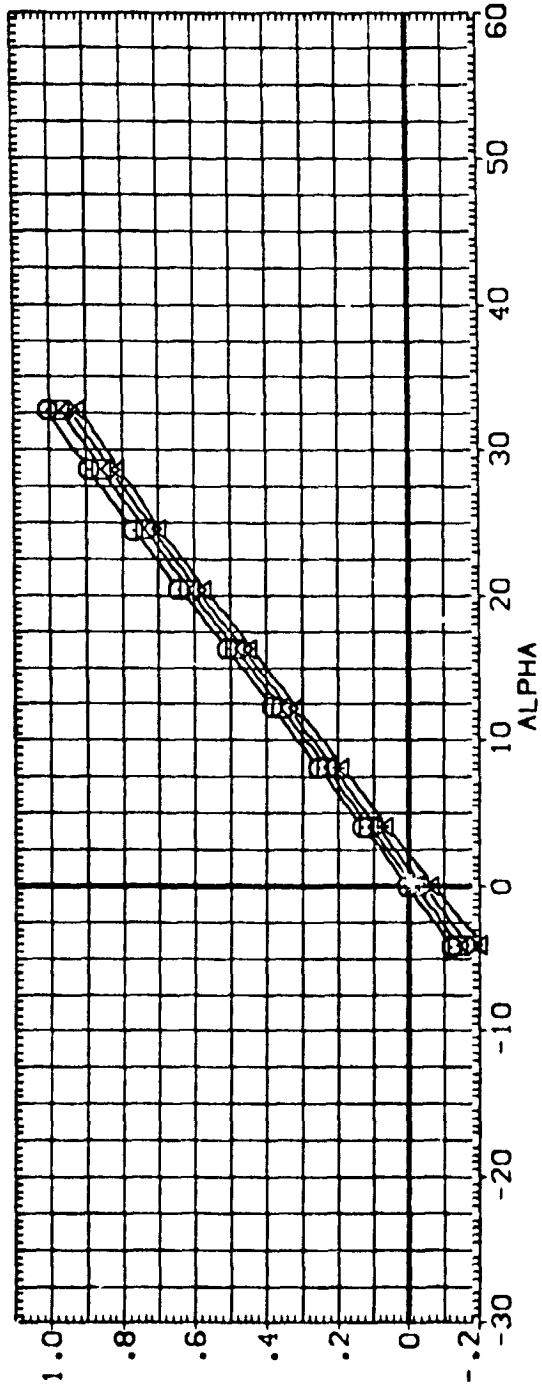


FIGURE 4. FULL SPAN ELEVON PITCH CHARACTERISTICS
(A) $MACH = 2.50$

DATA SET SYMBOL	CONFIGURATION	DESCRIPTION	ELV-L0	ELV-LJ	ELV-RI	ELV-R0
[24001]	LA-19	UPVT 1101 RI-0898/139	0.000	0.000	0.000	0.000
[24002]	LA-19	UPVT 1101 RI-0898/139	-10.000	-10.000	-10.000	-10.000
[24003]	LA-19	UPVT 1101 RI-0898/139	-20.000	-20.000	-20.000	-20.000
[24004]	LA-19	UPVT 1101 RI-0898/139	-40.000	-40.000	-40.000	-40.000

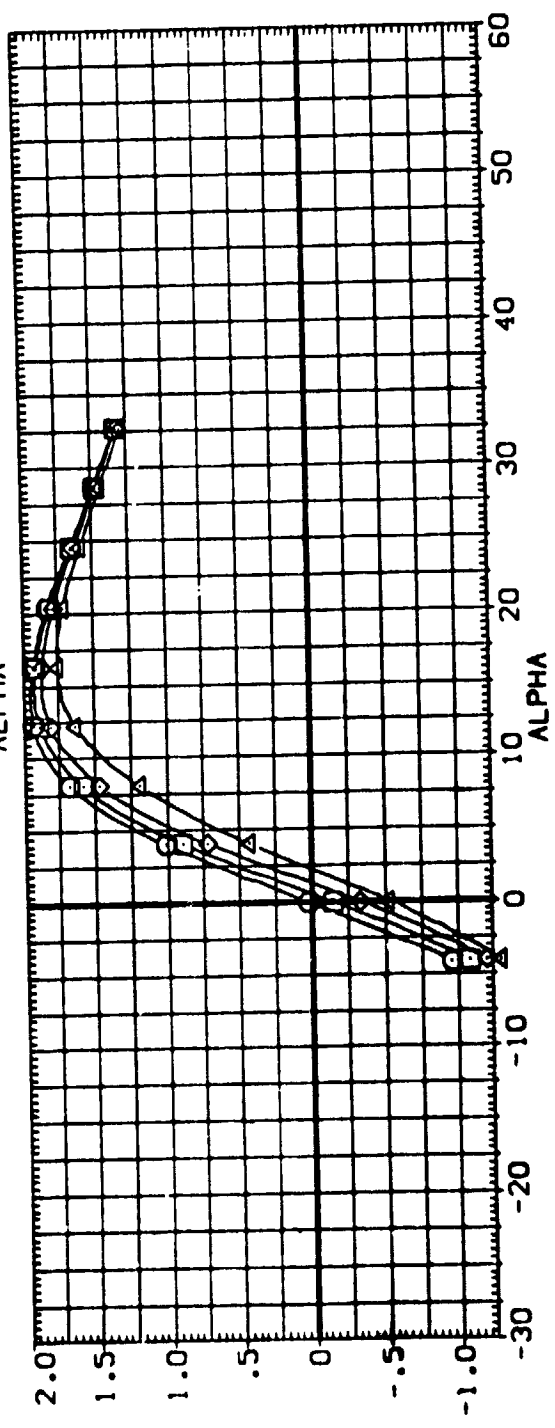
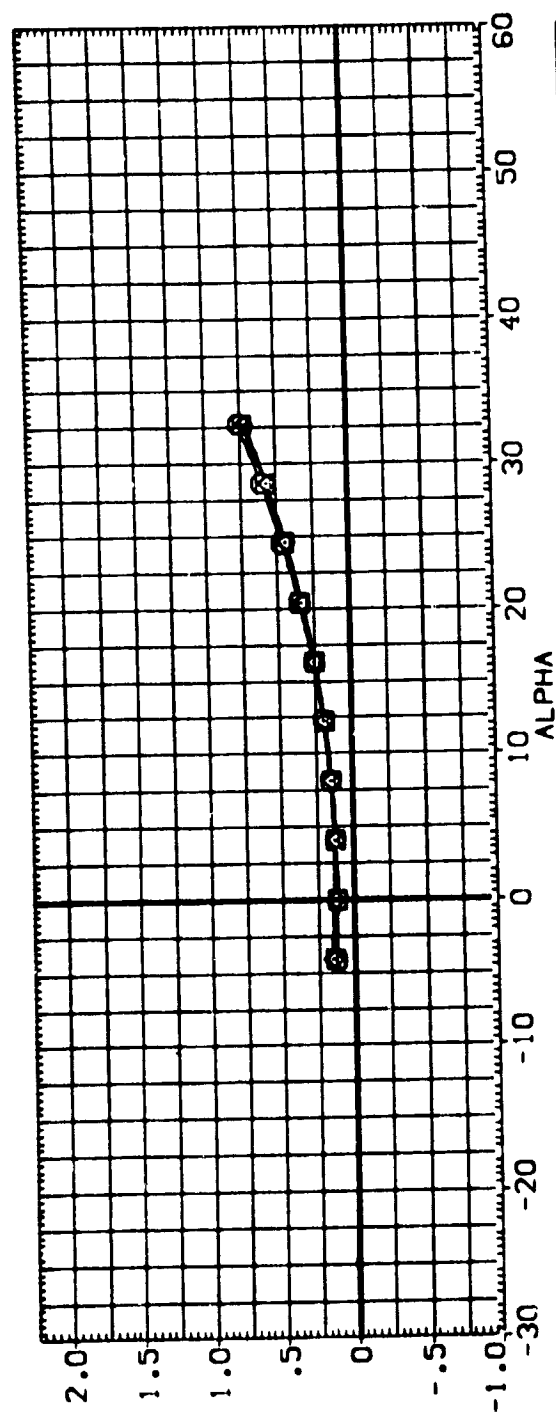


FIGURE 4. FULL SPAN ELEVON PITCH CHARACTERISTICS

(A)MACH = 2.50

DATA SET SYMBOL	CONF	IGURATION	DESCRIPTION	ELV-L0	ELV-L1	ELV-R1	ELV-R0
(A-1001)	LA-19	SP-T	11.01	R1-0898/139	0898	SP-T	ELEVON
(A-1002)	LA-19	SP-T	11.01	R1-0898/139	0898	SP-T	ELEVON
(A-1003)	LA-19	SP-T	11.01	R1-0898/139	0898	SP-T	ELEVON
(A-1004)	LA-19	SP-T	11.01	R1-0898/139	0898	SP-T	ELEVON
(A-1005)	LA-19	SP-T	11.01	R1-0898/139	0898	SP-T	ELEVON
(A-1006)	LA-19	SP-T	11.01	R1-0898/139	0898	SP-T	ELEVON
(A-1007)	LA-19	SP-T	11.01	R1-0898/139	0898	SP-T	ELEVON

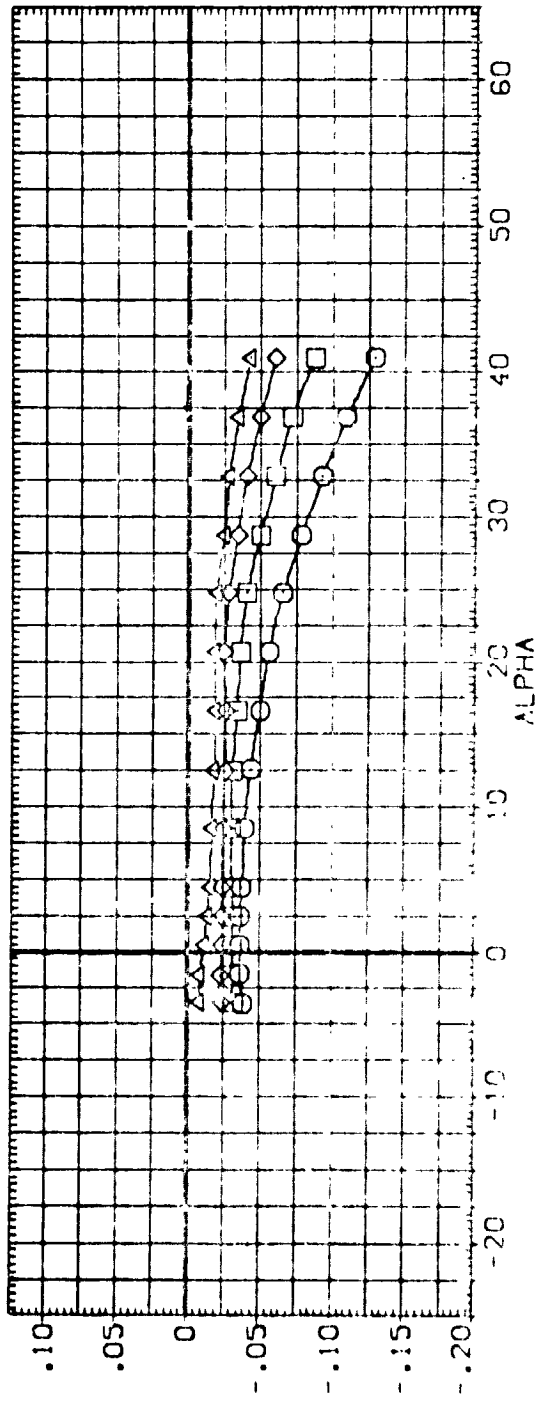
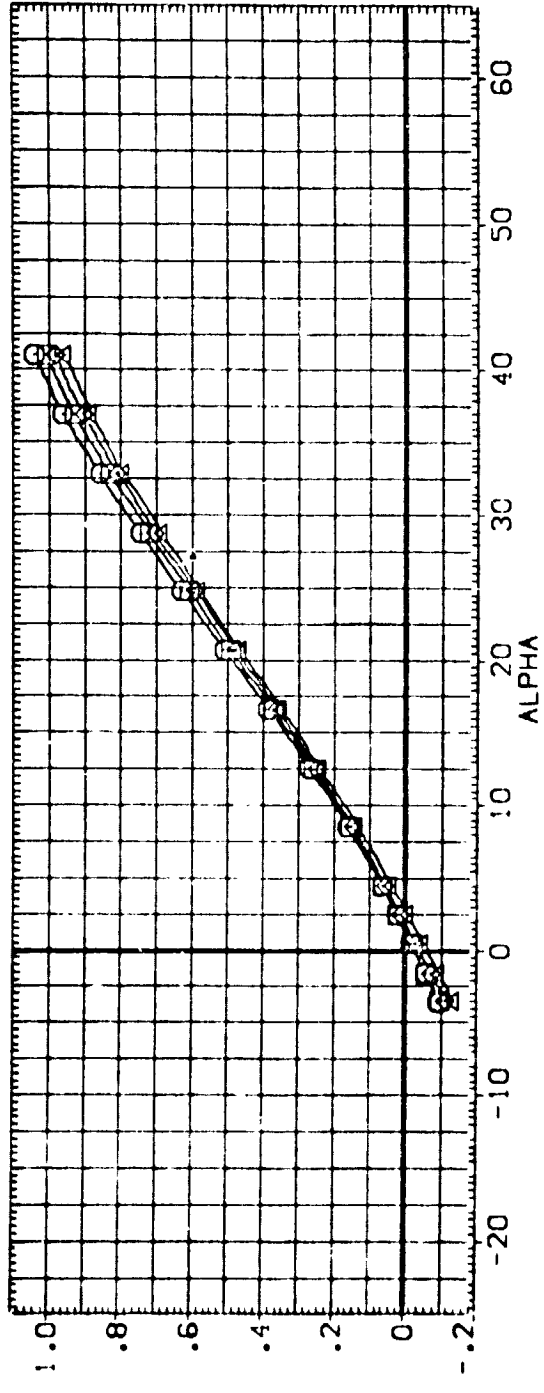


FIGURE 4. FULL SPAN ELEVON PITCH CHARACTERISTICS

(B)MACH = 4.60

DATA SET 57888. CONFIGURATION DESCRIPTION

LA-49	UPVT	RI	OR938/39	OR9	SPLIT	ELEVON	ELV-L0	ELV-L1	ELV-R1	ELV-R0
[001]	[001]	[001]	[001]	[001]	[001]	[001]	[001]	[001]	[001]	[001]
[005]	[005]	[005]	[005]	[005]	[005]	[005]	[005]	[005]	[005]	[005]
[009]	[009]	[009]	[009]	[009]	[009]	[009]	[009]	[009]	[009]	[009]
[013]	[013]	[013]	[013]	[013]	[013]	[013]	[013]	[013]	[013]	[013]
[017]	[017]	[017]	[017]	[017]	[017]	[017]	[017]	[017]	[017]	[017]

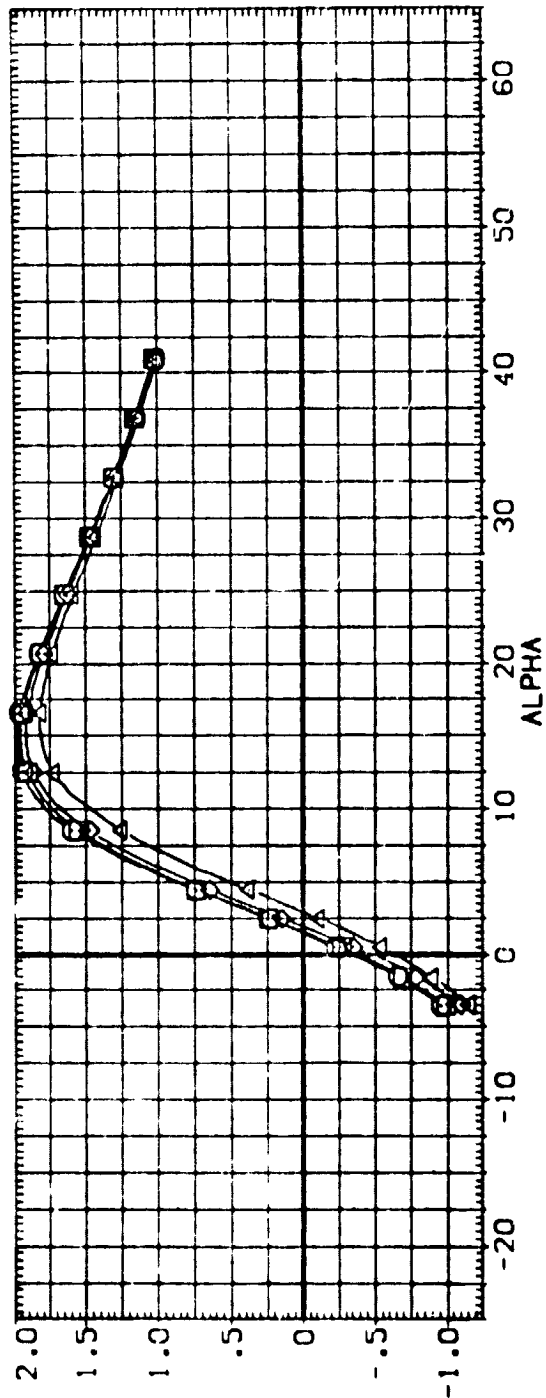
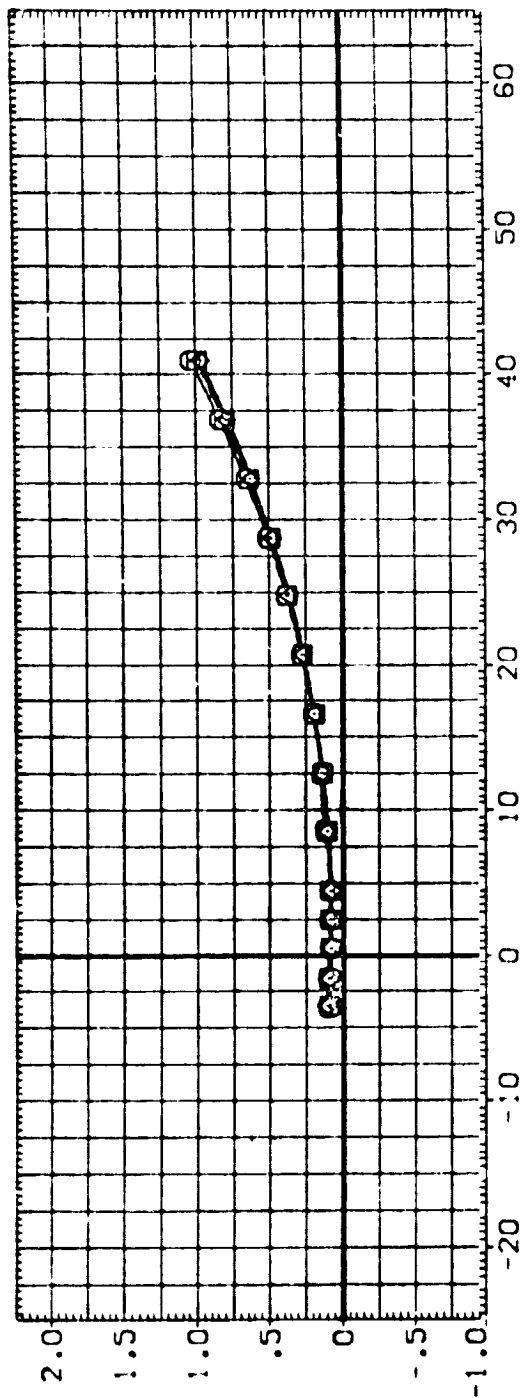


FIGURE 4. FULL SPAN ELEVON PITCH CHARACTERISTICS

(B)MACH = 4.60



DATA SET SYMBOL CONFIGURATION DESCRIPTION

LA-49	UP-T	1101	R1-0058/139	008	SPLIT	ELEVON
LA-49	UP-T	1101	R1-0058/139	008	SPLIT	ELEVON
LA-49	UP-T	1101	R1-0058/139	008	SPLIT	ELEVON
LA-49	UP-T	1101	R1-0058/139	008	SPLIT	ELEVON

ELV-L0 ELV-L1 ELV-R1 ELV-R0

.000	-40.000	-40.000	.000
.000	-20.000	-20.000	.000
.000	-10.000	-10.000	.000
.000	.000	.000	.000

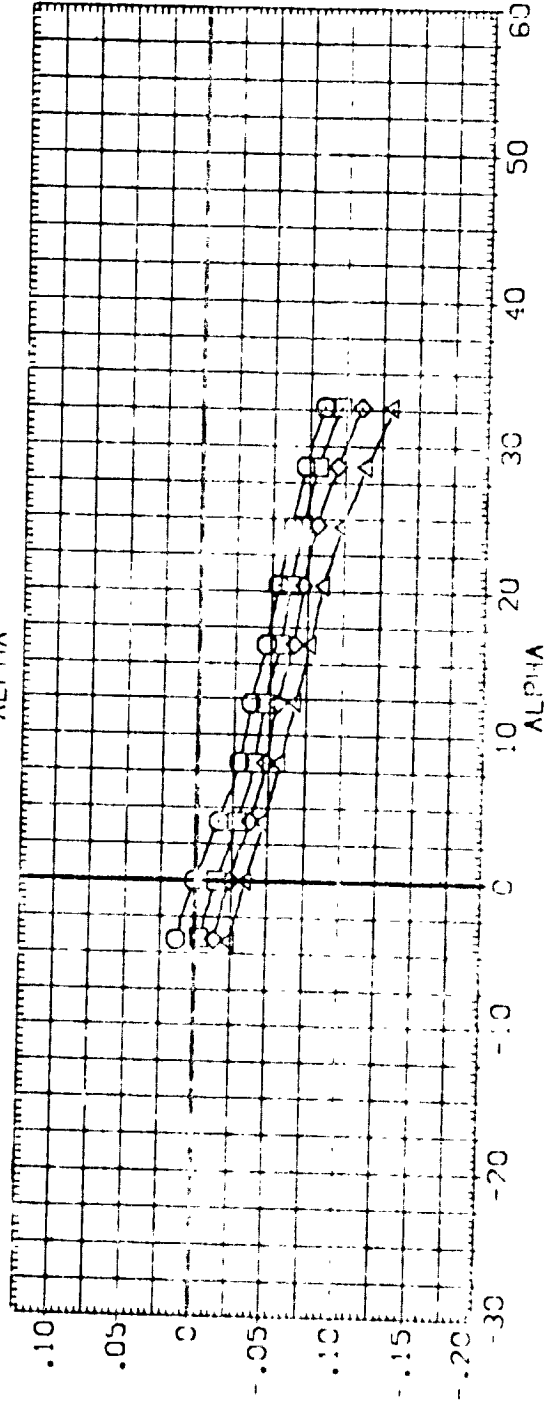
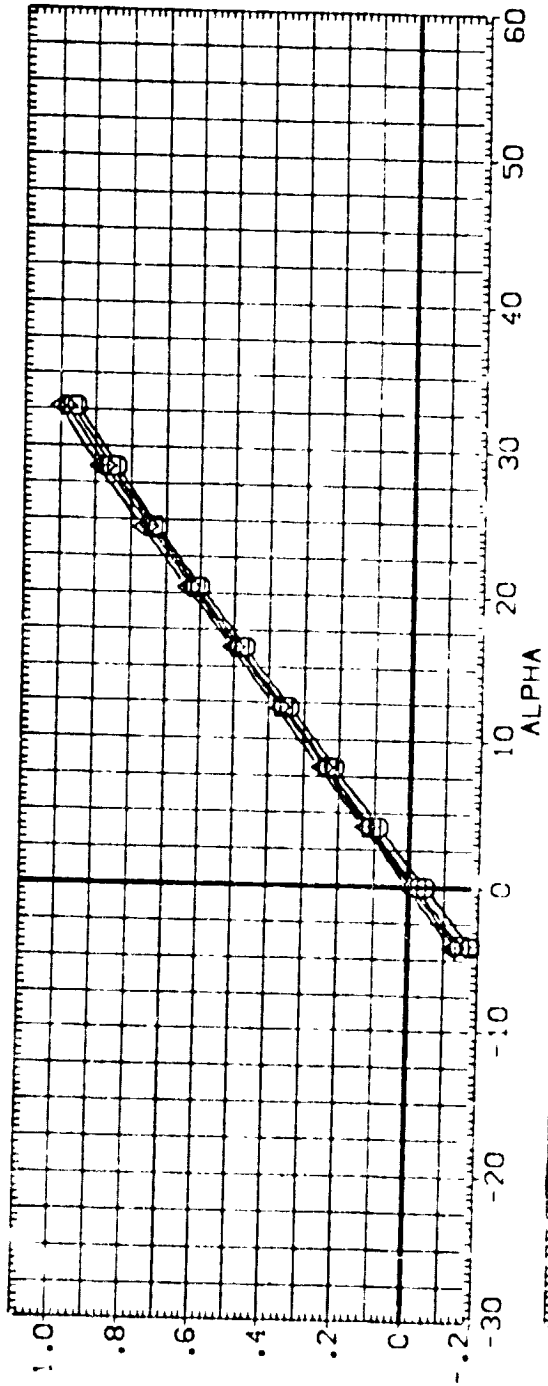


FIGURE 5. INBOARD ELEVON PITCH CHARACTERISTICS

(MACH - 2.50)

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA SET 51800. CONFIGURATION DESCRIPTION

CONF	DESCRIPTION	ELV-L0	ELV-L1	ELV-R1	ELV-R0
0041	A-19 PVT	0.000	40.000	40.000	0.000
0042	A-19 PVT	0.000	20.000	20.000	0.000
0043	A-19 PVT	0.000	10.000	10.000	0.000
0044	A-19 PVT	0.000	0.000	0.000	0.000

SP-L1 ELEVON
SP-R1 ELEVON
SP-L1 ELEVON
SP-R1 ELEVON

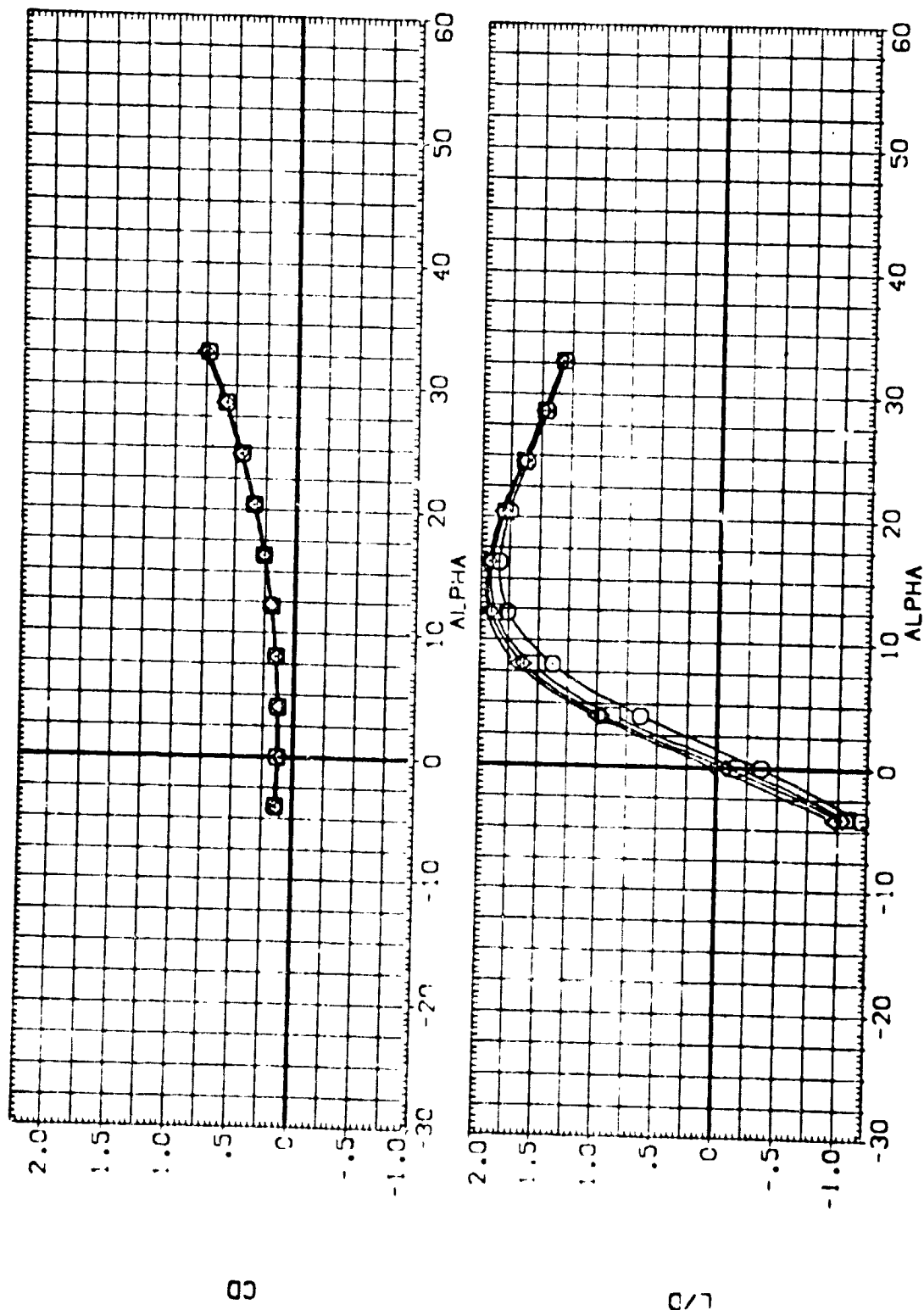


FIGURE 5. INBOARD ELEVON PITCH CHARACTERISTICS

(A)MACH = 2.50

DATA SET SYMB.	Q	X	LOCATION DESCRIPTION	ORR	SA	IT	ELEV	ELV-L6	ELV-L1	ELV-R1	ELV-R0
[P-004]			LA-49 PVT [10] R-0899/35	ORR	SA	IT	ELEV	.000	-40.000	-40.000	.000
[P-003]			LA-49 PVT [10] R-0899/35	ORR	SA	IT	ELEV	.000	-20.000	-20.000	.000
[P-002]			LA-49 PVT [10] R-0899/35	ORR	SA	IT	ELEV	.000	-10.000	-10.000	.000
[P-001]			LA-49 PVT [10] R-0899/35	ORR	SA	IT	ELEV	.000	.000	.000	.000

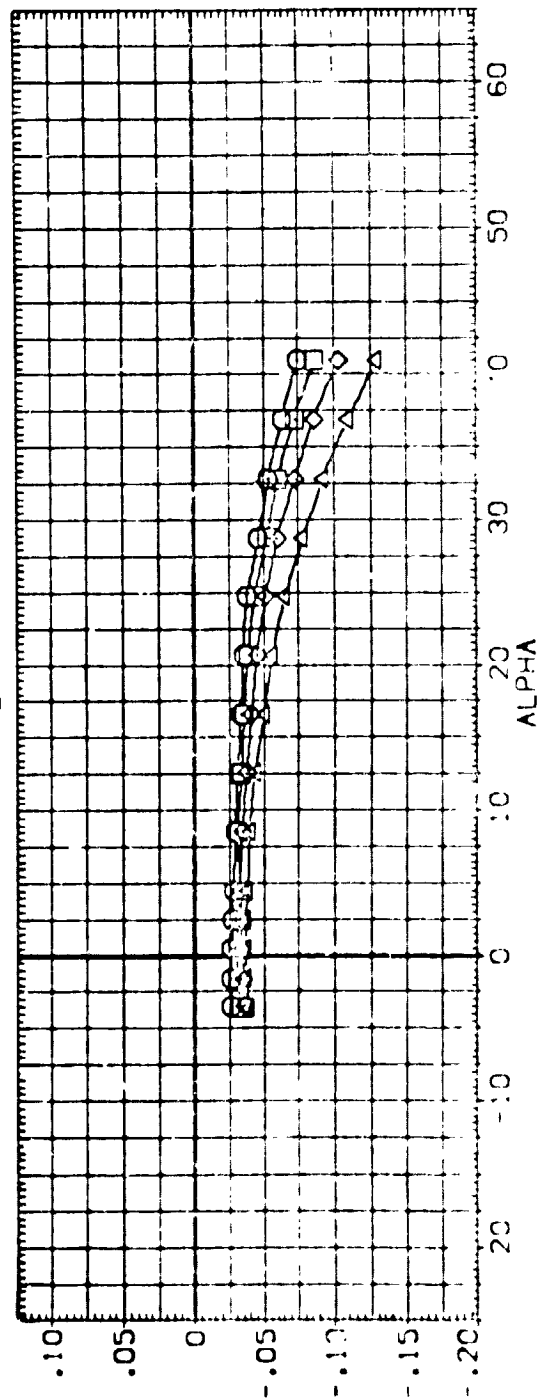
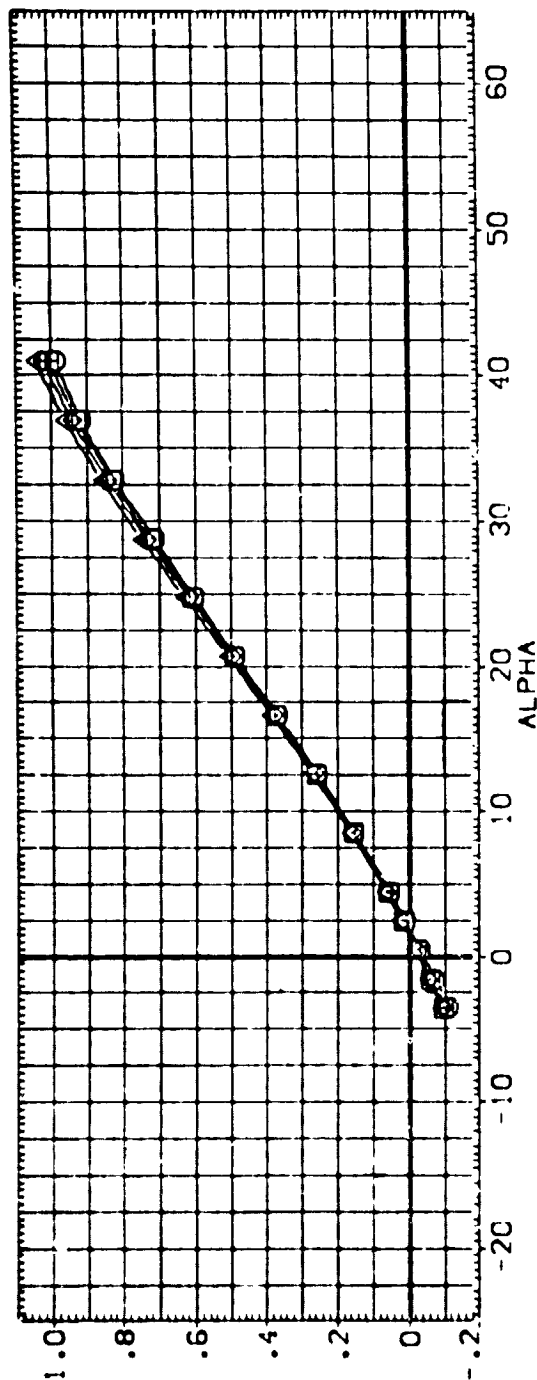


FIGURE 5. INBOARD ELEVON PITCH CHARACTERISTICS

(3)MAC = 4.60

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ELV-L0	ELV-L1	ELV-R1	ELV-R0
(R-004)	LA-49 UPT 1101 R1-0898/139 078 SALT ELEVON	.000	-40.000	-40.000	.000
(R-003)	LA-49 UPT 1101 R1-0898/139 078 SALT ELEVON	.000	-20.000	-20.000	.000
(R-002)	LA-49 UPT 1101 R1-0898/139 078 SALT ELEVON	.000	-10.000	-10.000	.000
(R-001)	LA-49 UPT 1101 R1-0898/139 078 SALT ELEVON	.000	.000	.000	.000

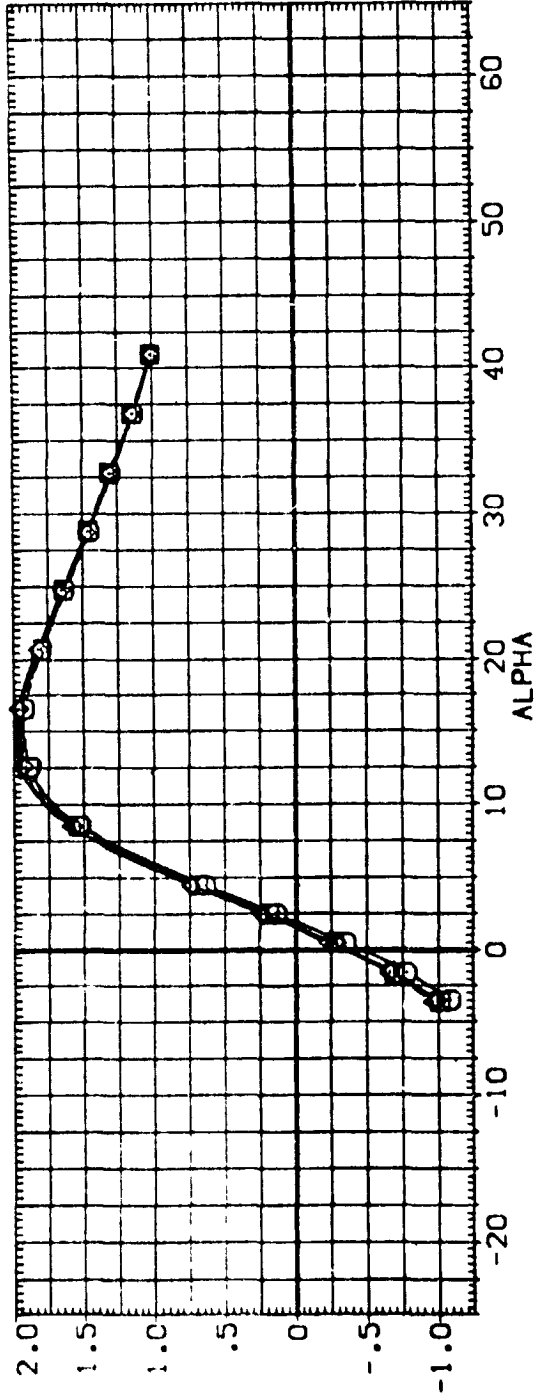
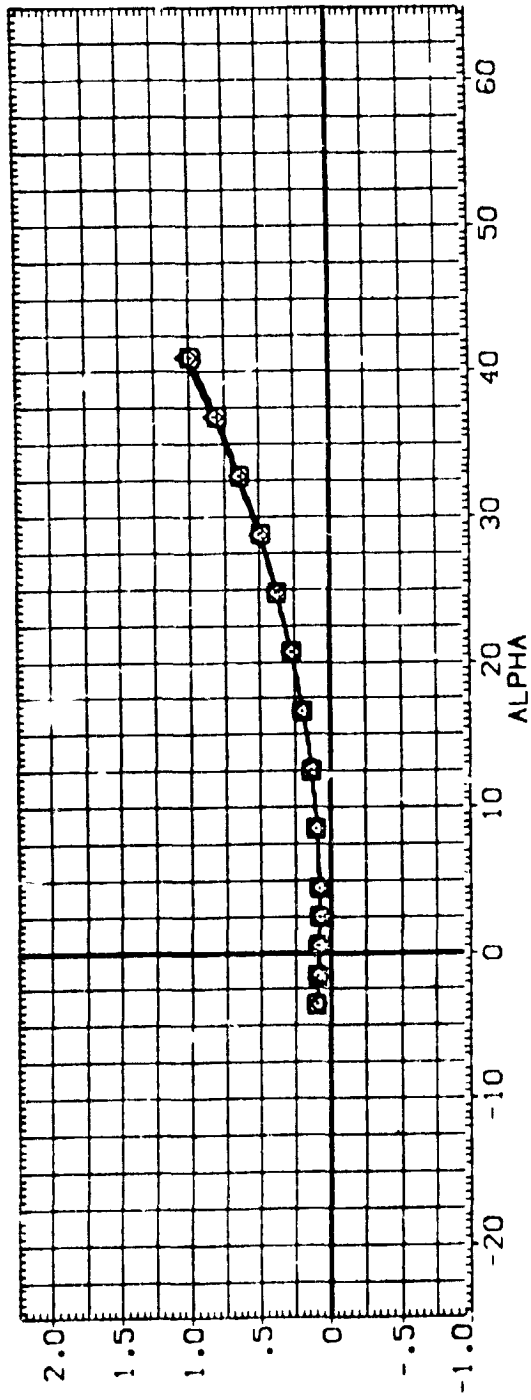


FIGURE 5. INBOARD ELEVON PITCH CHARACTERISTICS

(B)MACH = 4.60



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ELV-LG	ELV-LI	ELV-RI	ELV-RO
(R-4001)	LA-49 UPVT 1101 R1-0898/138	.000	.000	.000	.000
(R-4002)	LA-49 UPVT 1101 R1-0898/138	-10.000	.000	.000	-10.000
(R-4003)	LA-49 UPVT 1101 R1-0898/138	-20.000	.000	.000	-20.000
(R-4004)	LA-49 UPVT 1101 R1-0898/138	-40.000	.000	.000	-40.000

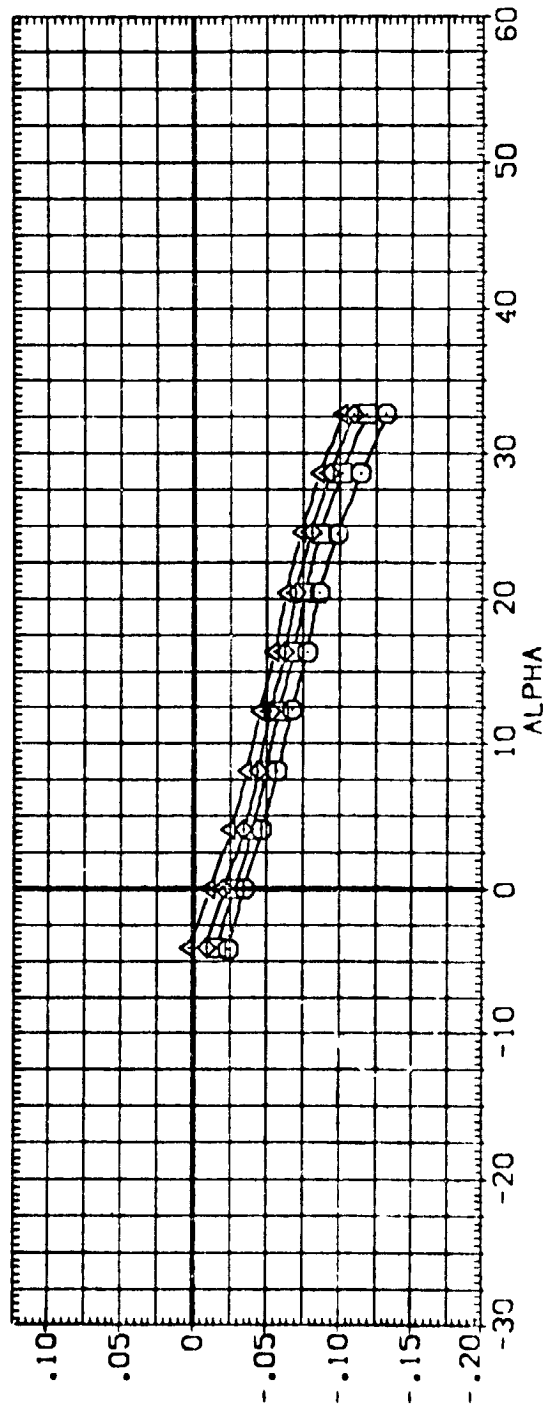
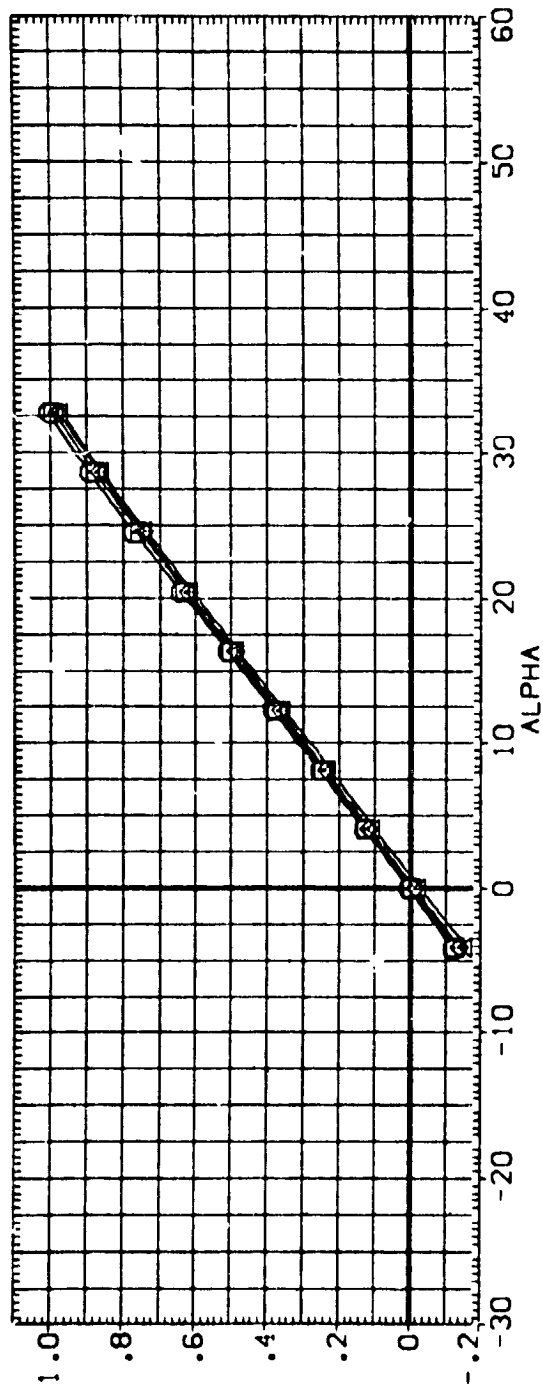


FIGURE 6. OUTBOARD ELEVON PITCH CHARACTERISTICS

(MACH = 2.50)

DATA SET SYMBO.	CONF.	DESCRIPTION	ELV-L0	ELV-L1	ELV-R1	ELV-R0
LA-19	UPVT	1101 R1-0898/139	0.000	0.000	0.000	0.000
LA-19	UPVT	1101 R1-0898/139	-10.000	0.000	0.000	-10.000
LA-19	UPVT	1101 R1-0898/139	-20.000	0.000	0.000	-20.000
LA-19	UPVT	1101 R1-0898/139	-40.000	0.000	0.000	-40.000

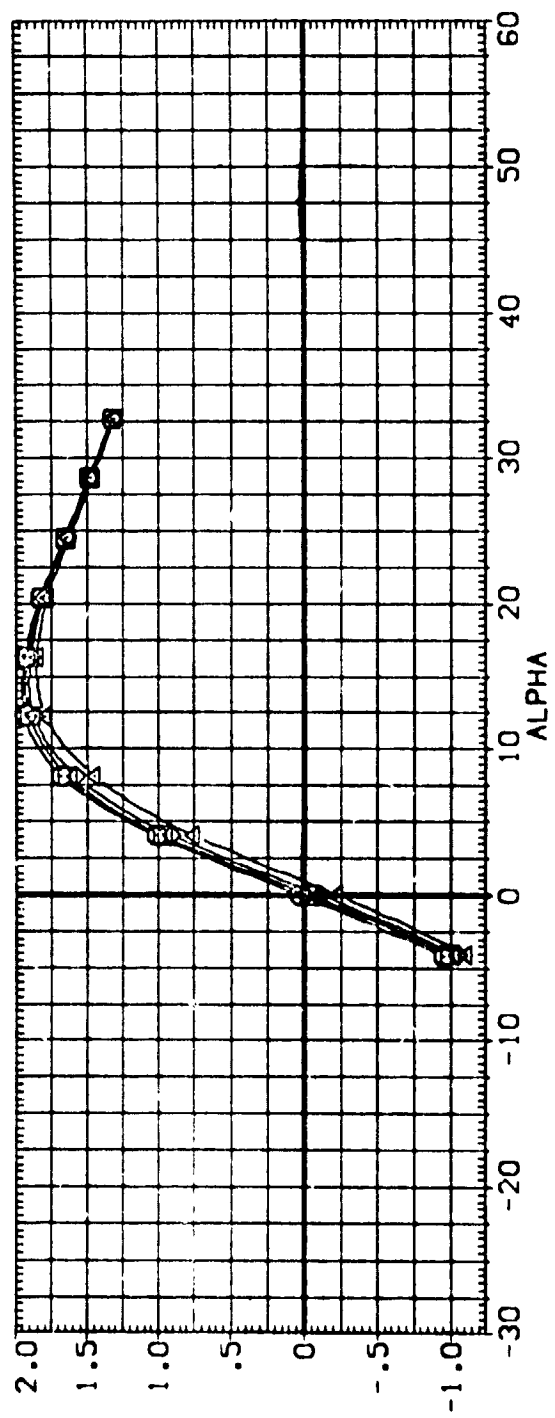
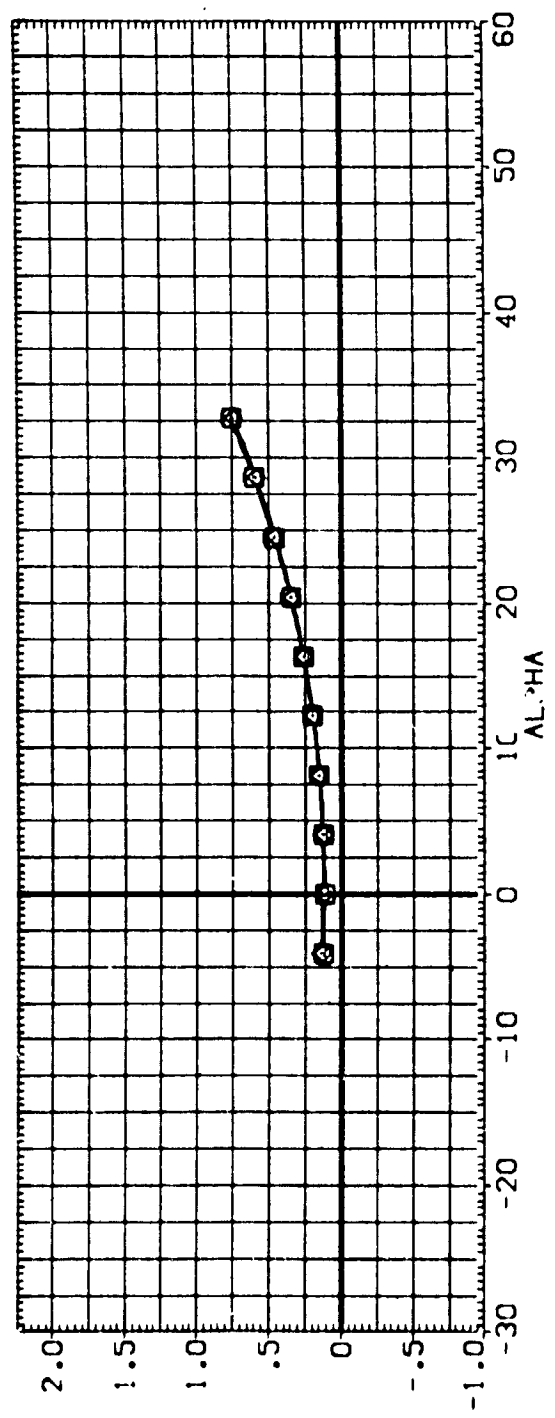


FIGURE 6. OUTBOARD ELEVON PITCH CHARACTERISTICS

(A)MACH = 2.50

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ELV-LO	ELV-LI	ELV-RI	ELV-RO
(R-001)	LA-49 UPVT 1101 R1-0898/139	.000	.000	.000	.000
(R-008)	LA-49 UPVT 1101 R1-0898/139	-10.000	.000	.000	-10.000
(R-009)	LA-49 UPVT 1101 R1-0898/139	-20.000	.000	.000	-20.000
(R-010)	LA-49 UPVT 1101 R1-0898/139	-40.000	.000	.000	-40.000

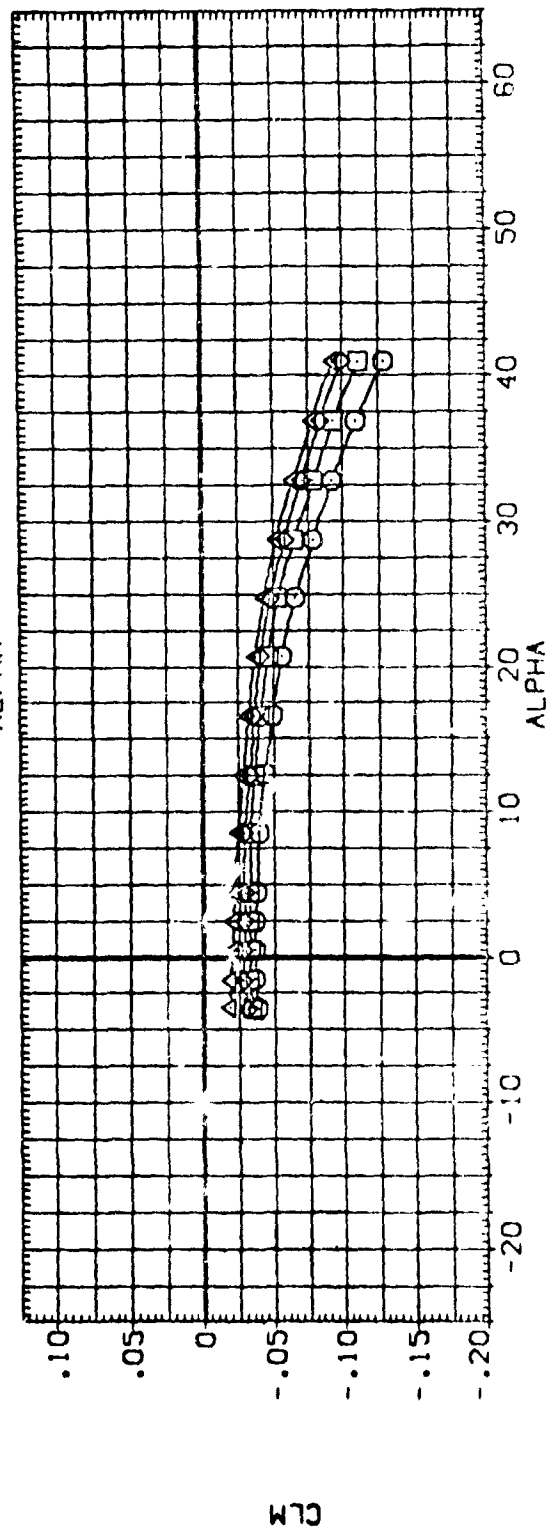
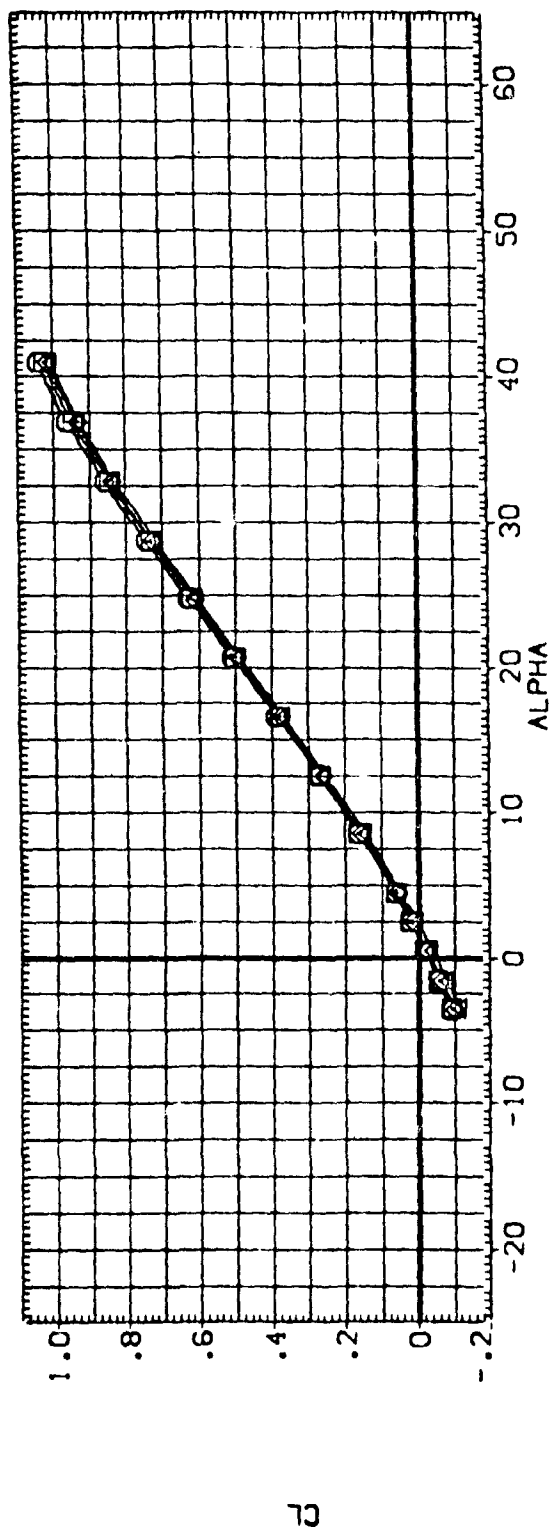


FIGURE 6. OUTBOARD ELEVON PITCH CHARACTERISTICS

(3) MACH = 4.60

DATA SET SYMBOL	CONFIGURATION	DESCRIPTION	ELV-LQ	ELV-LJ	ELV-RI	ELV-RO
(R)001)	LA-49	UPVT 1101 RI-0898/139	0.000	0.000	0.000	0.000
(R)009)	LA-49	UPVT 1101 RI-0898/139	-10.000	0.000	0.000	-10.000
(R)009)	LA-49	UPVT 1101 RI-0898/139	-20.000	0.000	0.000	-20.000
(R)010)	LA-49	UPVT 1101 RI-0898/139	-40.000	0.000	0.000	-40.000

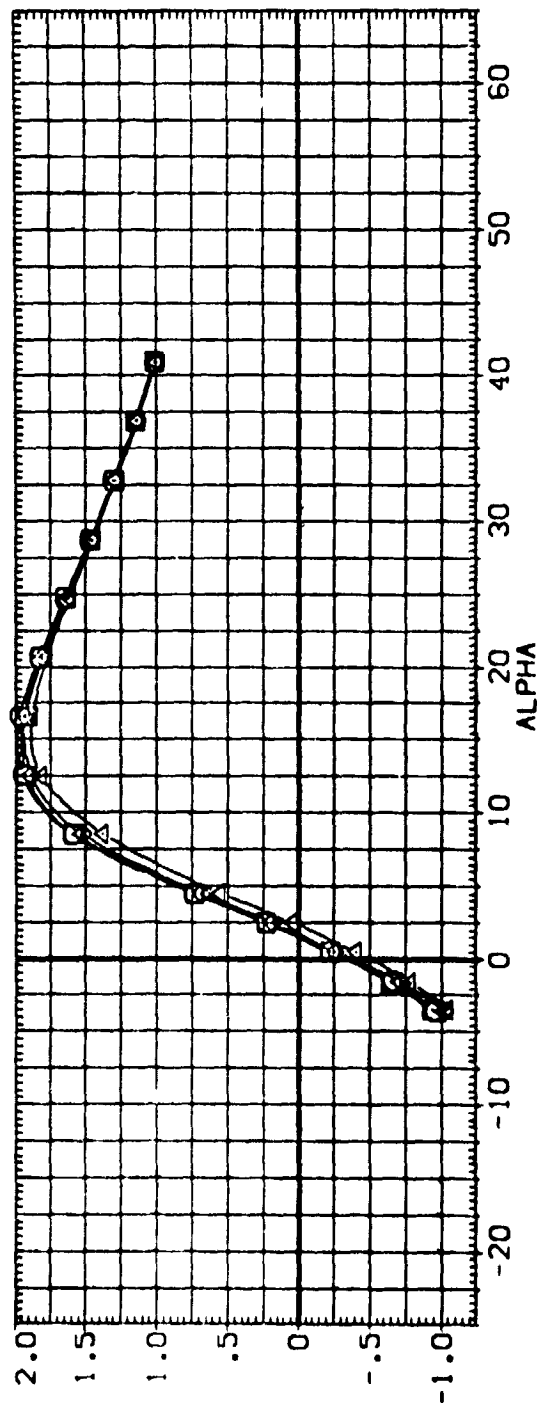
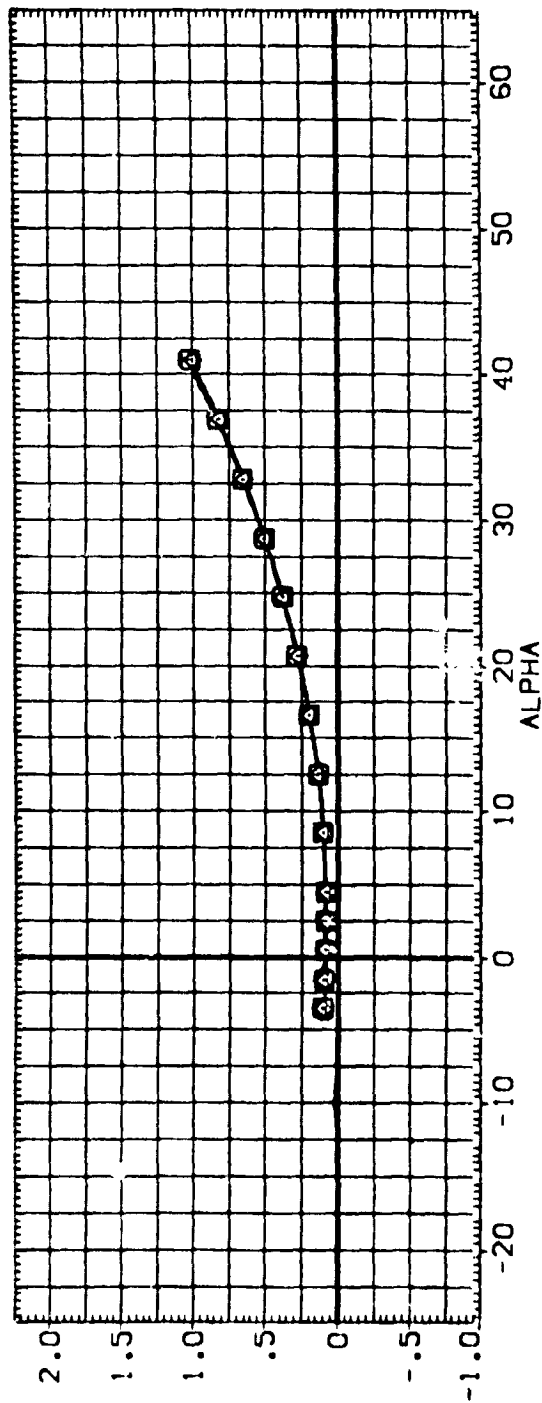


FIGURE 6. OUTBOARD ELEVON PITCH CHARACTERISTICS

(8)MACH = 4.60

LA-49 UPWT 1101 RI-0898/139 ORB SPLIT ELEVON (RHJ001)

SYMBOL
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 ○

PARAMETRIC VALUES
 ALPHA -4.172
 MACH 2.500
 80° LAP
 4.020
 8.106
 12.312

DATA SOURCE
 DATASET ELEVTR
 RHJ005 -10.000
 RHJ007 -40.000

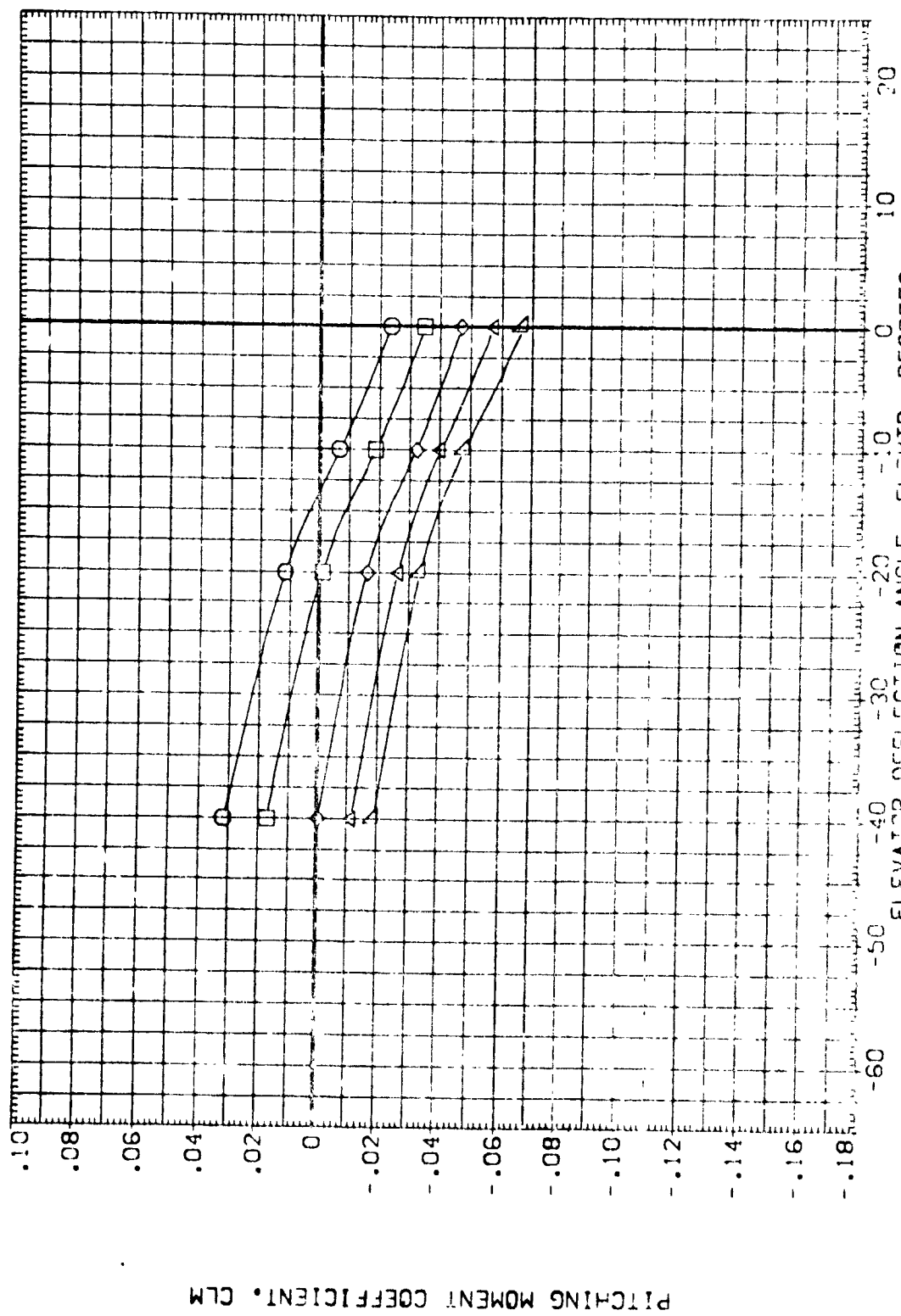


FIGURE 7. FULL SPAN ELEVON PITCH CONTROL EFFECTIVENESS

SYMBOL

ALPHA
16.292
20.408
24.504
28.669
32.717

MACH
0.45
0.60

PARAMETRIC VALUES
BETA
2.500
SPDRK
.000
.000

DATA SOURCE
ELEVTR
-20.000
-25.000
-30.000

DATASET
RHJ005
RHJ007

ELEVTR
-10.000
-40.000

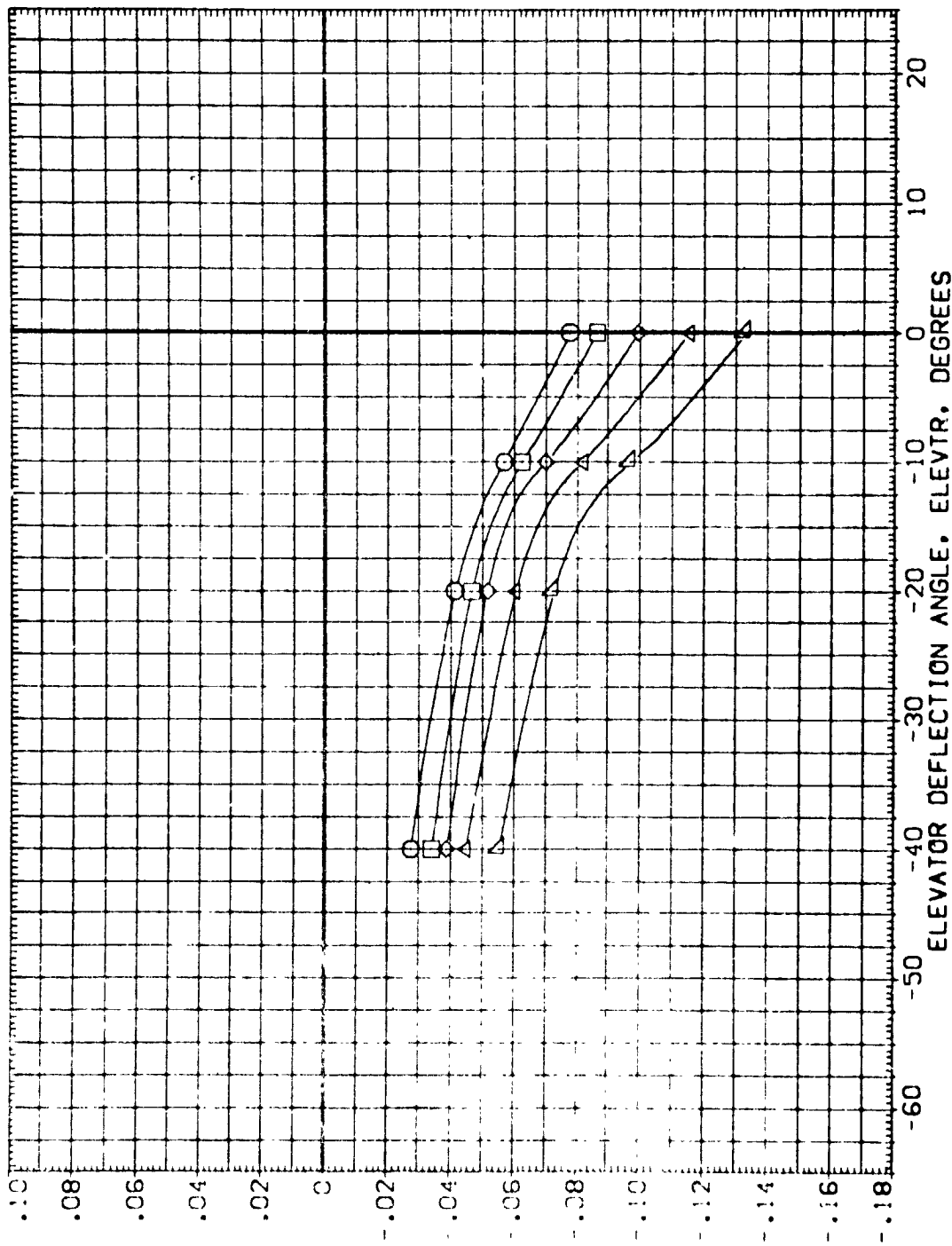


FIGURE 7. FULL SPAN ELEVON PITCH CONTROL EFFECTIVENESS



LA-49 UPWT 1101 RI-089B/139 ORB SPLIT ELEVON (RHJ001)

SYMBOL
○
□
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△
▽

ALPHA
-3.548
-1.553
.433
2.462
4.466

MACH
BDF LAP
AILRON

PARAMETRIC VALUES
4.600 BETA
.000 SPOBRK
.000

.000 DATASET
25.000 RHJ001
RHJ006

DATA SOURCE
ELEVTR
-20.000
-10.000
-40.000

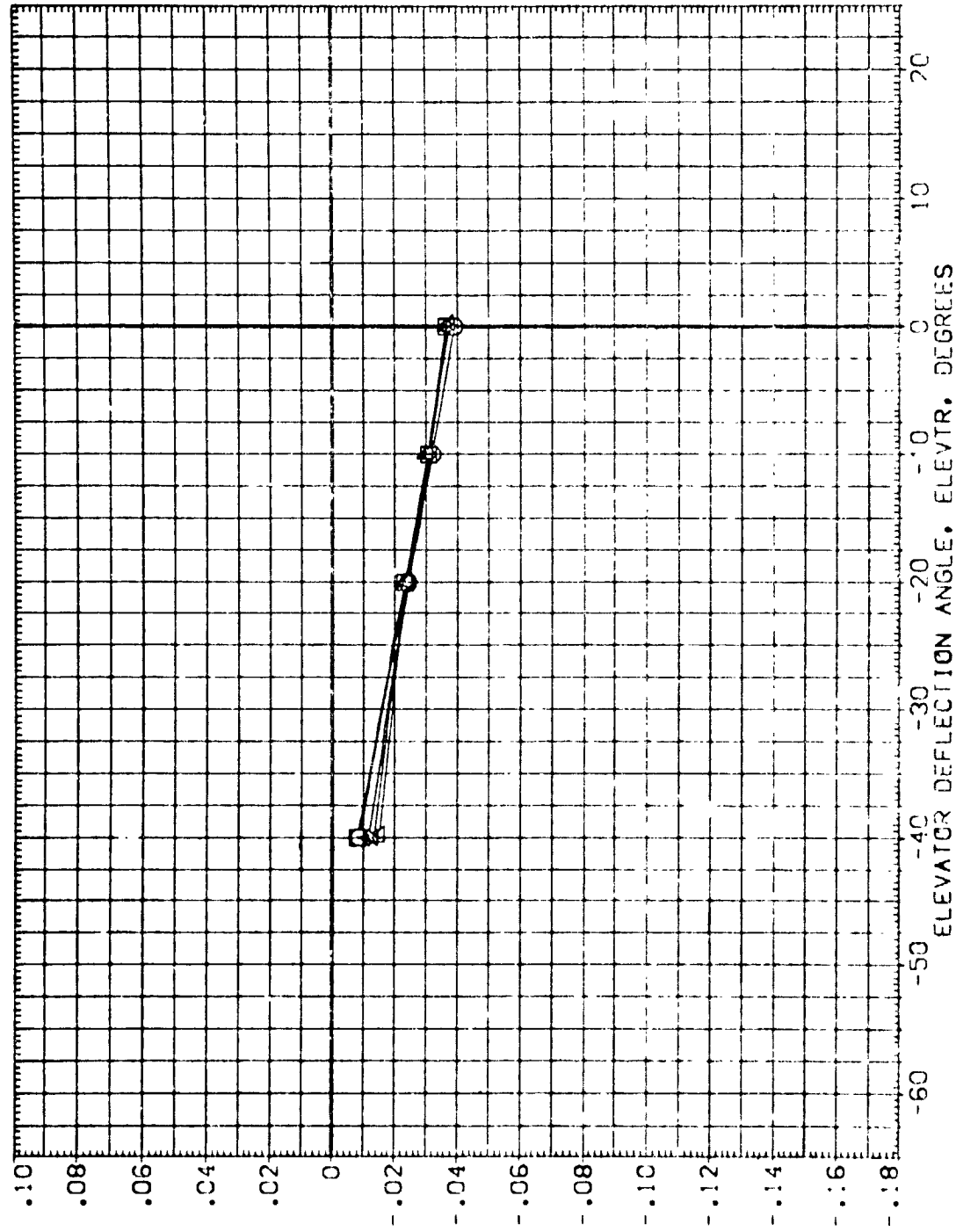


FIGURE 7. FULL SPAN ELEVON PITCH CONTROL EFFECTIVENESS

LA-49 UPWT 1101 RI-089B/139 ORB SPLIT ELEVON (RHJ001)

SYN-02

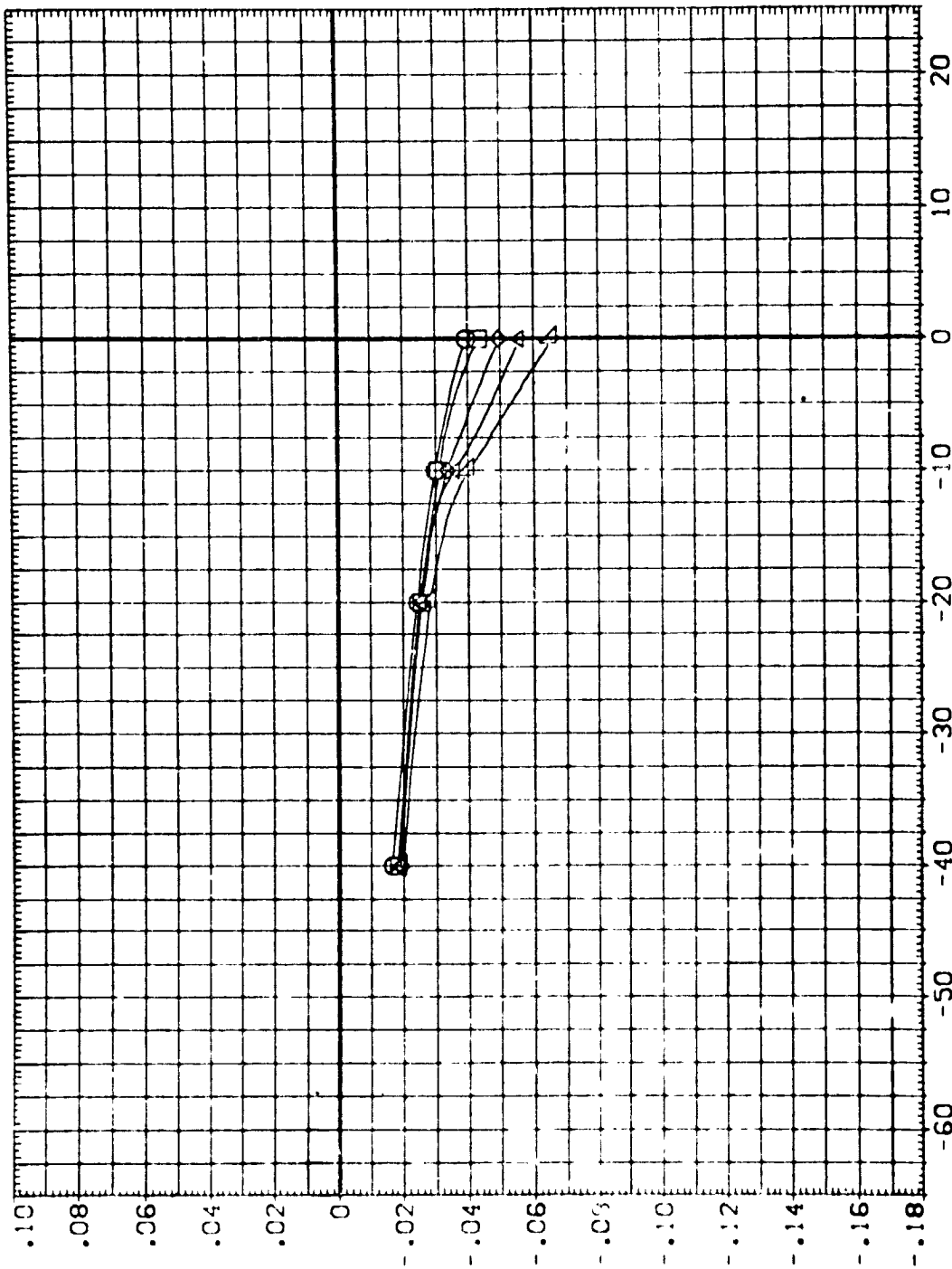
ALPHA
8.540
12.575
16.602
20.646
24.715

MACH
BOFLAP
ATLORN

PARAMETRIC VALUES
4.600 BETA
.000 SPOBRK
.000

.000 DATASET
25.000 RHJ001
RHJ006

DATA SOURCE
ELEVTR
-20.000
-10.000
-40.000



PITCHING MOMENT COEFFICIENT, CLM

FIGURE 7. FULL SPAN ELEVON PITCH CONTROL EFFECTIVENESS

LA-49 UPWT 1101 RI-089B/139 ORB SPLIT ELEVON (RHJ001)

SYMBOL
○ □ ◇ △

PARAMETRIC VALUES		DATA SOURCE	
ALPHA	MACH	BETA	ELEVTR
28.780	4.500	.000	RHJ005
32.804	80° LAP	.000	RHJ007
36.891	AILRON	.000	

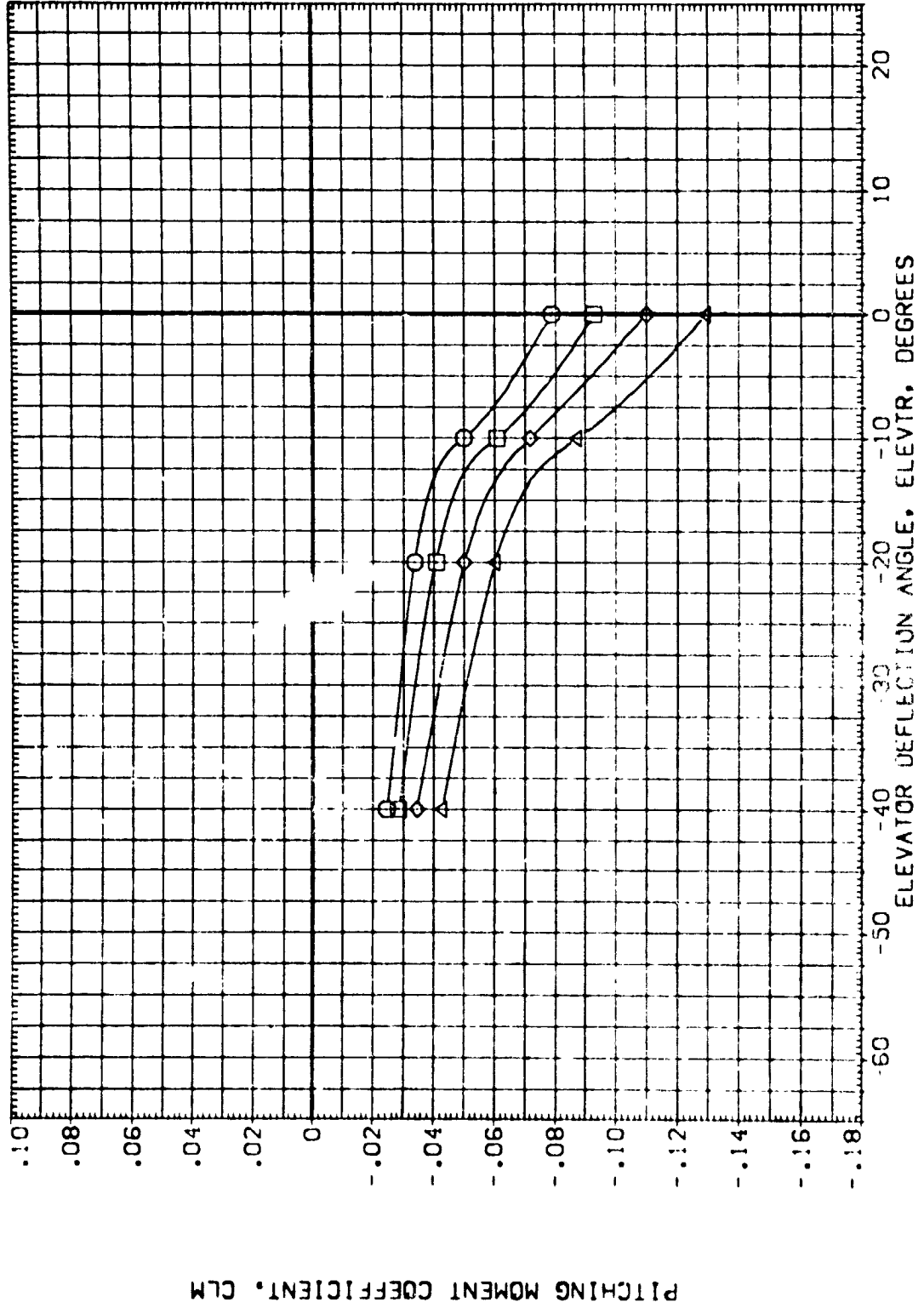


FIGURE 7. FULL SPAN ELEVON PITCH CONTROL EFFECTIVENESS

(B4JFO1)



PAGE 18

LA-49 UPWT 1101 RI-089B/139 ORB SPLIT ELEVON (BHJF01)

SYMBOL
 ○ □ ◇ △

ELEVTR
 -40.000
 -20.000
 -10.000
 .000

PARAMETRIC VALUES
 MACH 4.630
 BETA .000
 SPDRBK .000

DATA SOURCE
 ALPHA
 -3.000
 4.000
 12.000
 20.000
 28.000

DATA SET ALPHA
 BHJF01 .000
 BHJF02 8.000
 BHJF03 16.000
 BHJF04 24.000
 BHJF05 32.000

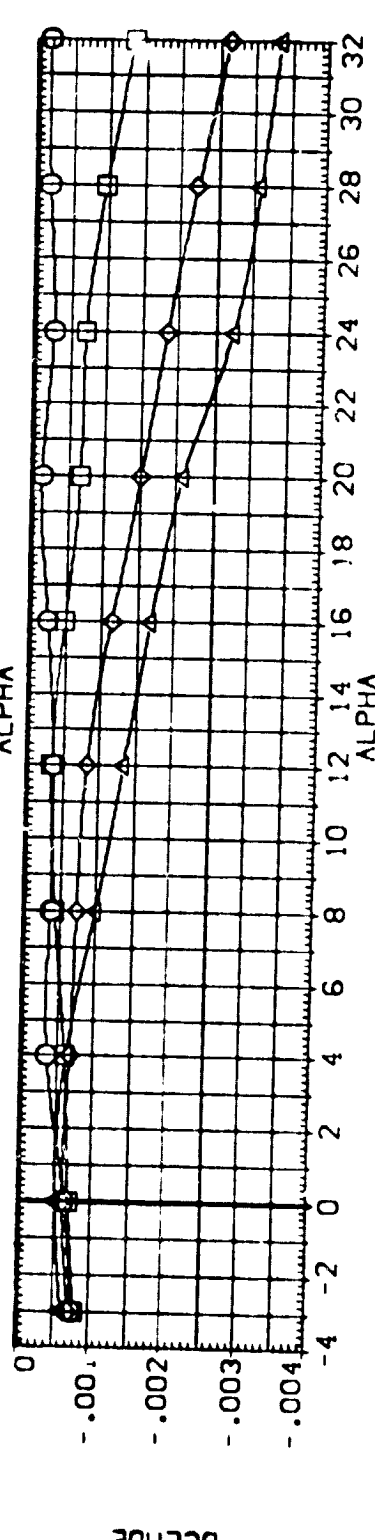
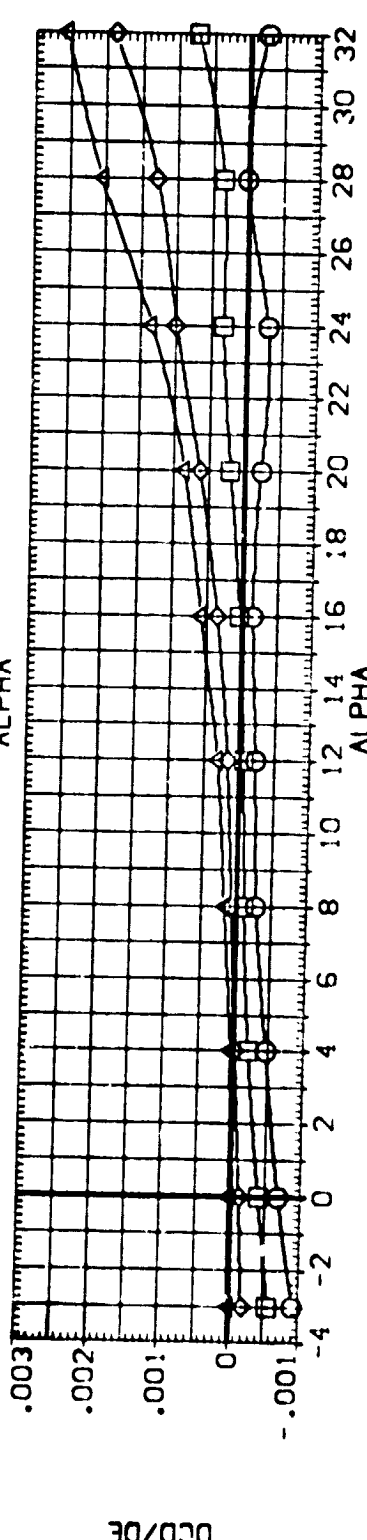
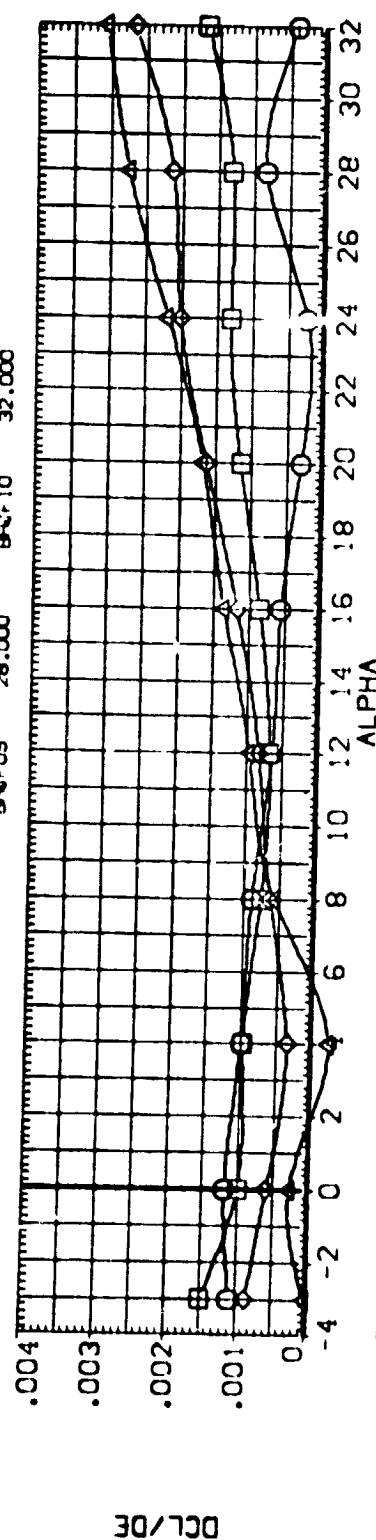


FIGURE 7. FULL SPAN ELEVON PITCH CONTROL EFFECTIVENESS

LA-49 UPWT 1101 RI-0898/139 ORB SPLIT ELEVON (RHJ004)

SYMBOL
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 ◇
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PARAMETRIC VALUES
 ALPHA -4.072 MACH 2.500
 ELV-LI -0.004 ELV-LI 0.000
 4.092 BOFLAP 0.000
 9.130 AILERON 0.000
 12.224

DATA SOURCE
 DATASET ELV-LI
 .000 DATASET ELV-LI
 .000 RHJ004 -40.000
 25.000 RHJ002 -10.000
 RHJ003
 RHJ001

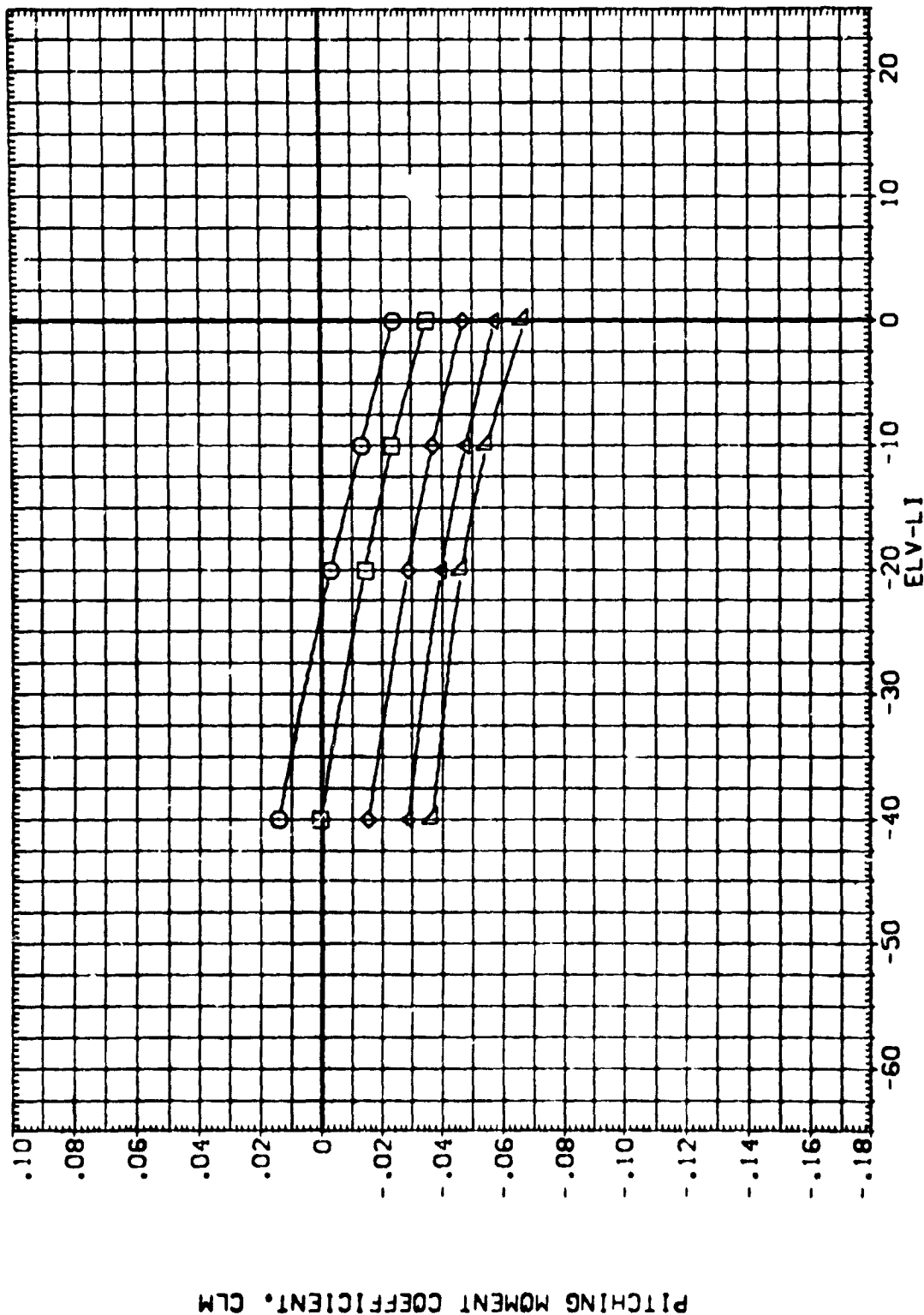


FIGURE 8. INBOARD ELEVON PITCH CONTROL EFFECTIVENESS

-A-49 UPWT 1101 RI-0898/139 ORB SPLIT ELEVON (RHJ004)

SYMBOL
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X
◇
△
▽

ALPHA
16.315
20.426
24.518
28.632
32.770

MACH
ELEV LO
BOFLAP
AILRON

PARAMETRIC VALUES
2.500 BETA
.000 ELEV-RO
.000 SPORR
.000

.000 DATASET
.000 R-4000
25.000 R-4002

DATA SOURCE
ELV-LI
-10.000
-10.000

DATASET
R-4003
R-4001

ELV-LI
-20.000
-20.000

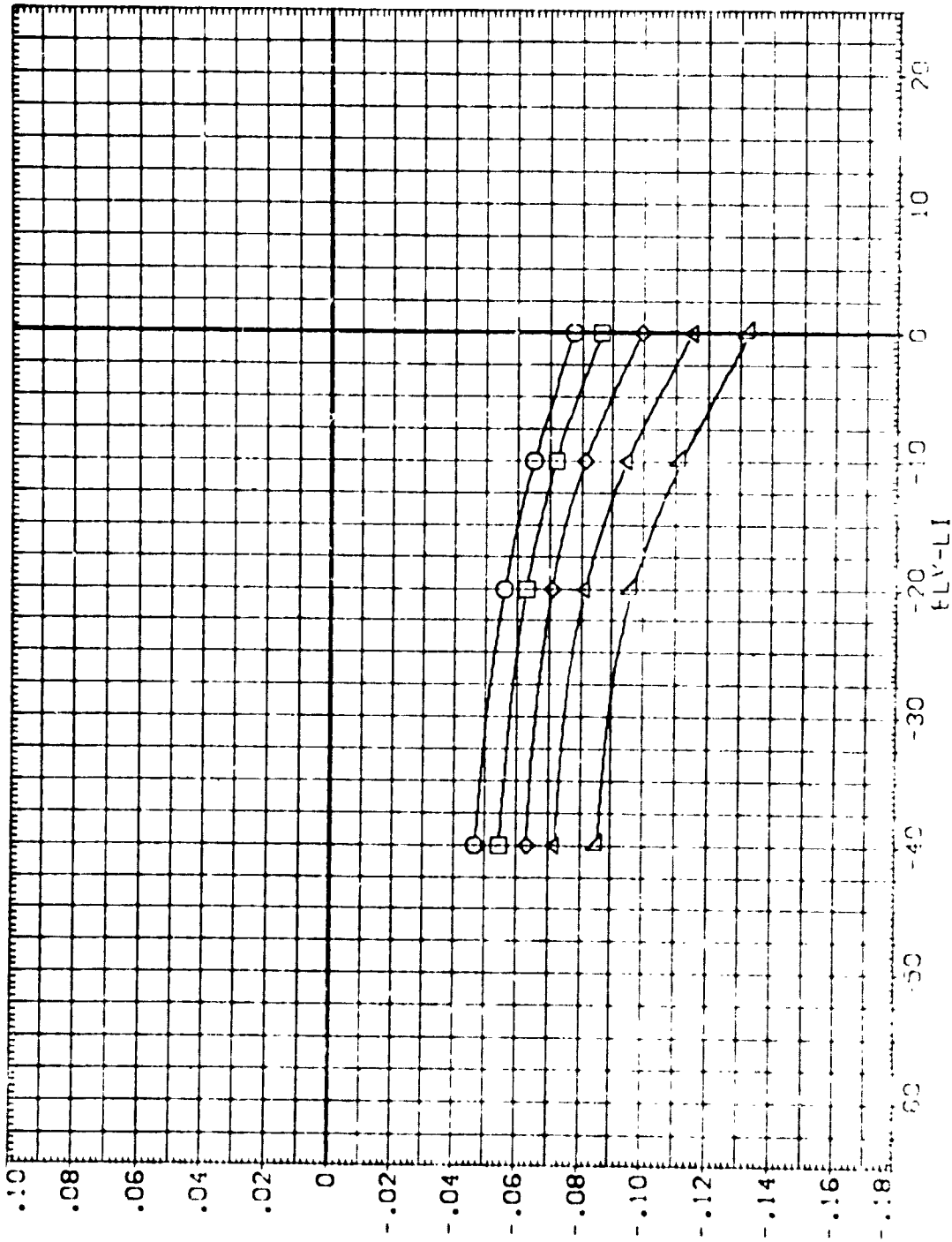


FIGURE 8. PITCHING MOMENT COEFFICIENT EFFECTIVENESS

LA-49 UPWT 1101 RI-0898/139 ORB SPLIT ELEVON (RHJ004)

SYMBOL
 □ ◇ △ ▽

PARAMETRIC VALUES				DATA SOURCE	
ALPHA	MACH	BETA	ELV-LI	DATASET	ELV-LI
-3.524	4.600	.000	ELV-LI	.000 RHJ004	-20.000
-1.576	.000	ELV-R0	-40.000	.000 RHJ003	-20.000
.453	80FLAP	SP08RK	-10.000	.000 RHJ001	-20.000
2.465	AILRON				
4.494					

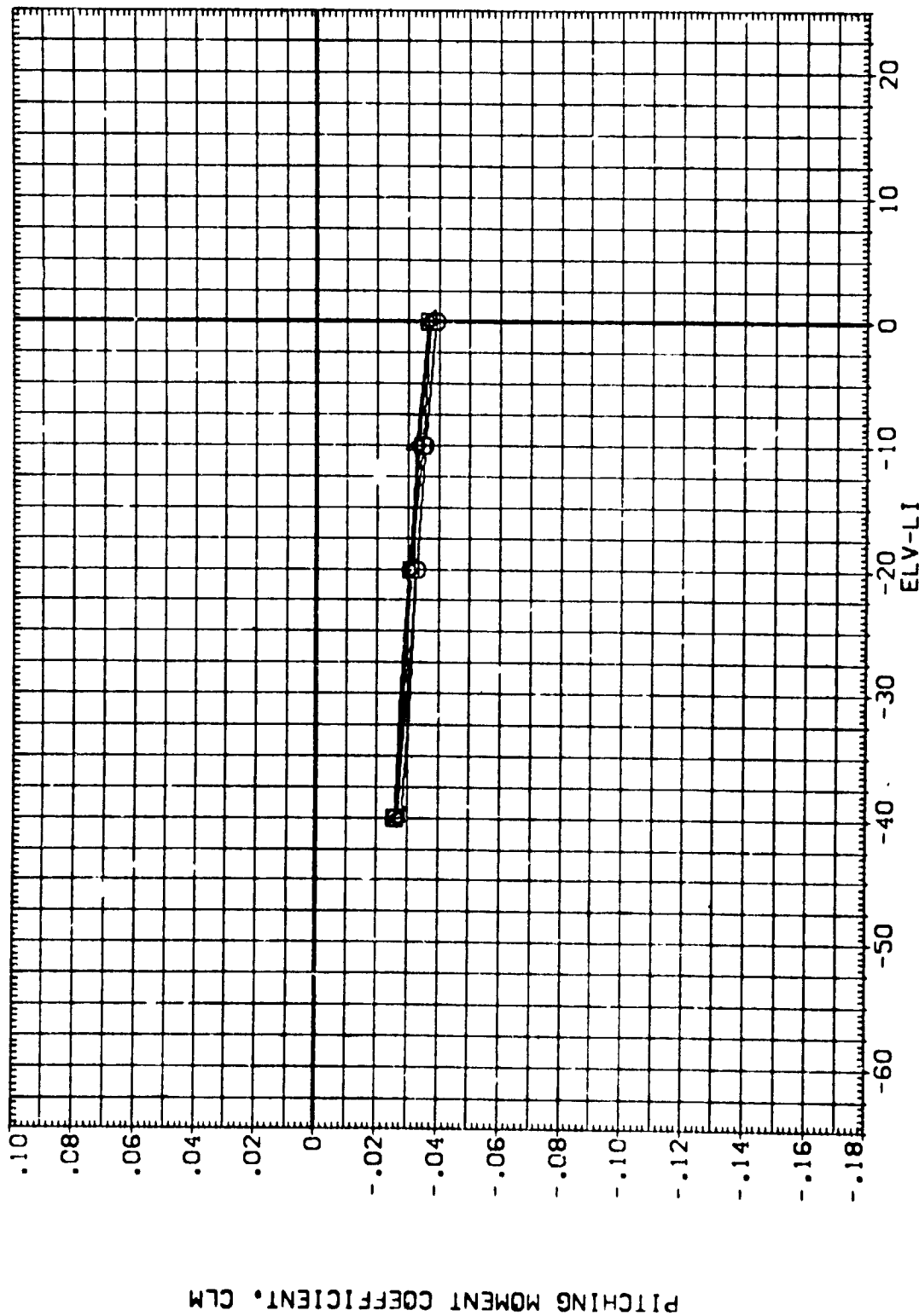


FIGURE 8. INBOARD ELEVON PITCH CONTROL EFFECTIVENESS

LA-49 UPWT 1101 RI-0898/139 ORB SPLIT ELEVON (RHJ004)

SYMBOL
000
44
47

PARAMETRIC VALUES
ALPHA 8.534
MACH 12.570
ELV-L0 16.591
BOFLAP 20.636
A1L0N 24.738
BETA 4.600
ELV-R0 .000
SPDRK .000

DATA SOURCE
.000 DATASET ELV-L1
-40.000 RHJ004
-10.000 RHJ002
25.000

DATASET ELV-L1
RHJ003 -20.000
RHJ001 .000

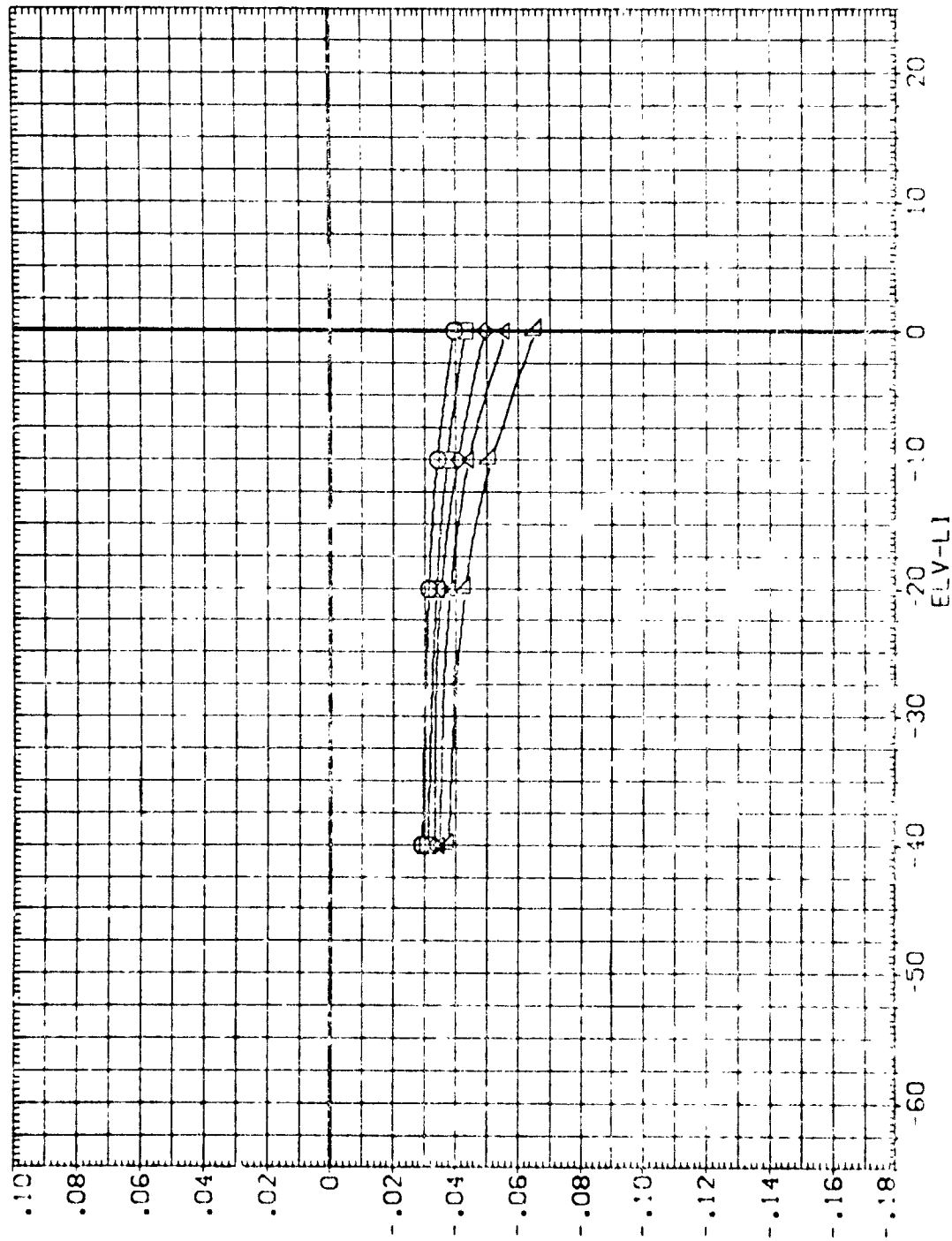


FIGURE 8, INBOARD ELEVON PITCH CONTROL EFFECTIVENESS

SYMBOL

○ □ △

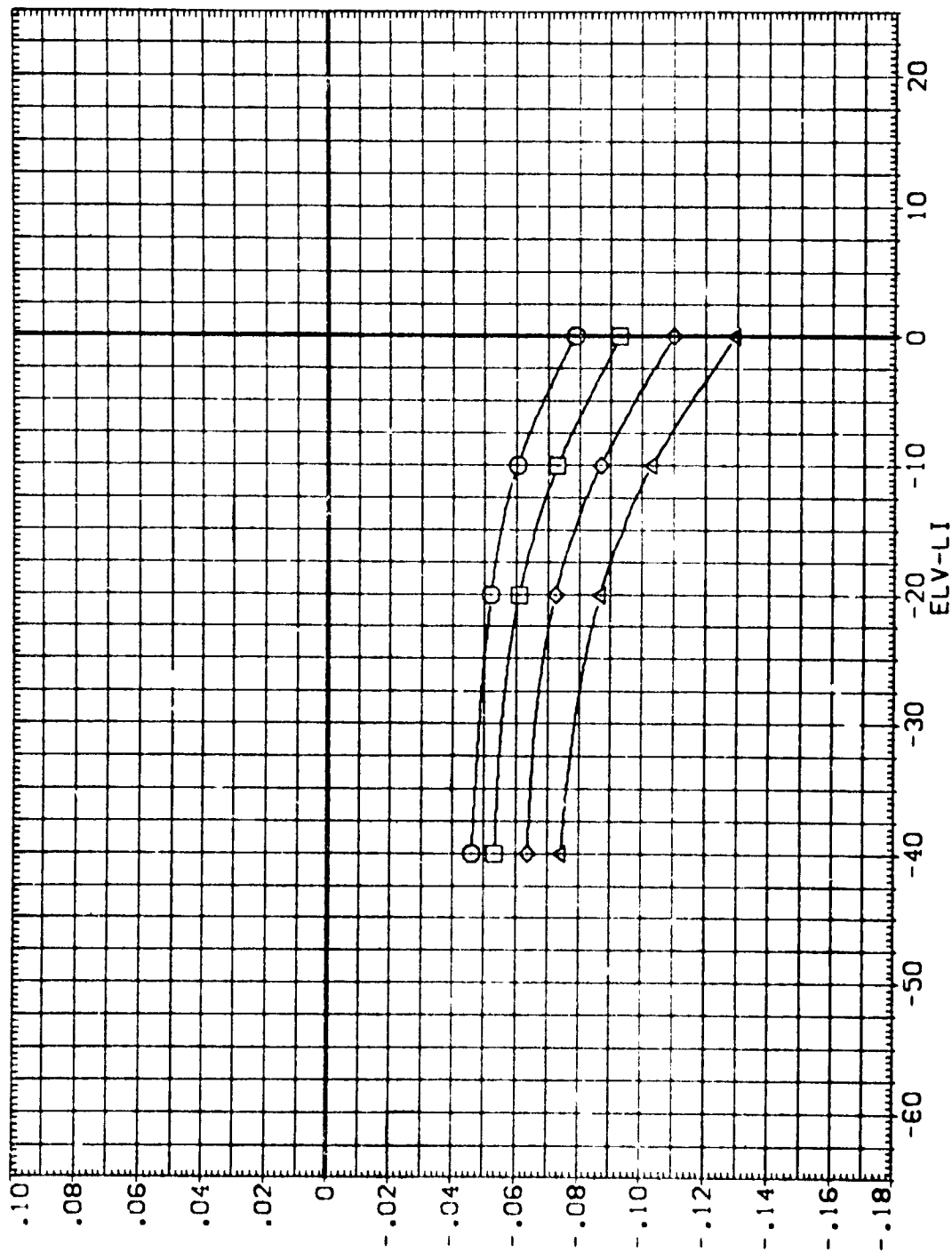
ALPHA
28.760
32.826
36.901
40.956

MACH
ELV-LO
BOFLAP
AILRON

PARAMETRIC VALUES
4.600 BETA
.000 ELV-R0
.000 SPOBRK

.000 DATASET
.000 RHJ004
25.000 RHJ002

DATA SOURCE
ELV-LI
-40.000 RHJ003
-10.000 RHJ001



PITCHING MOMENT COEFFICIENT, CLM

FIGURE 8. INBOARD ELEVON PITCH CONTROL EFFECTIVENESS



LA-49 UPWT 1101 RI-089B/139 ORB SPLIT ELEVON (BHJ101)

SYMBOL
 ○
 □
 ◇
 △

PARAMETRIC VALUES
 ELV-L1 MACH 2.500 BETA
 -40.000 ELV-H0 .000 ELV-R0
 -20.000 BUFLAP .000 SPOBRK
 -10.000 AILRON .000

DATA SOURCE

ALPHA DATASET ALPHA
 -3.000 BHJ102 .000
 4.000 BHJ104 8.000
 12.000 BHJ106 16.000
 20.000 BHJ108 24.000
 28.000 BHJ110 32.000

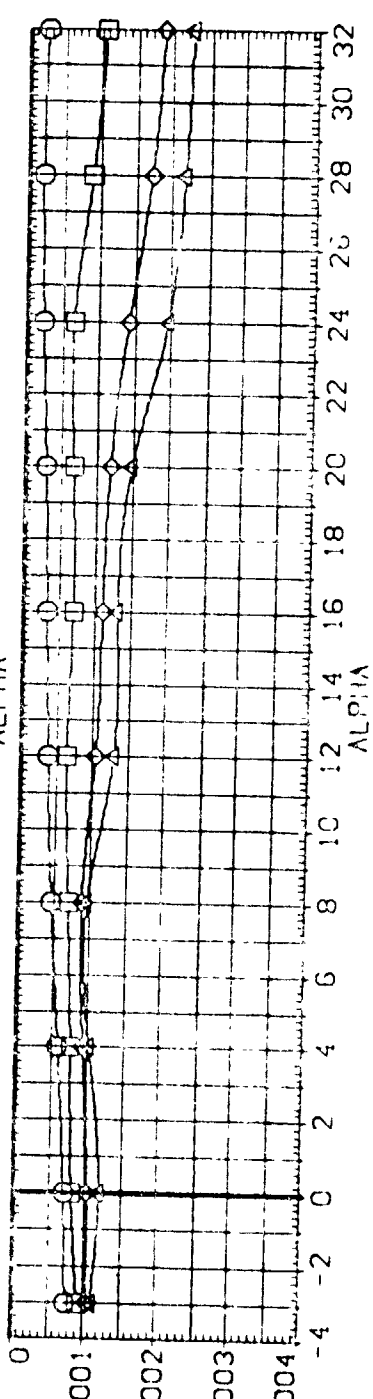
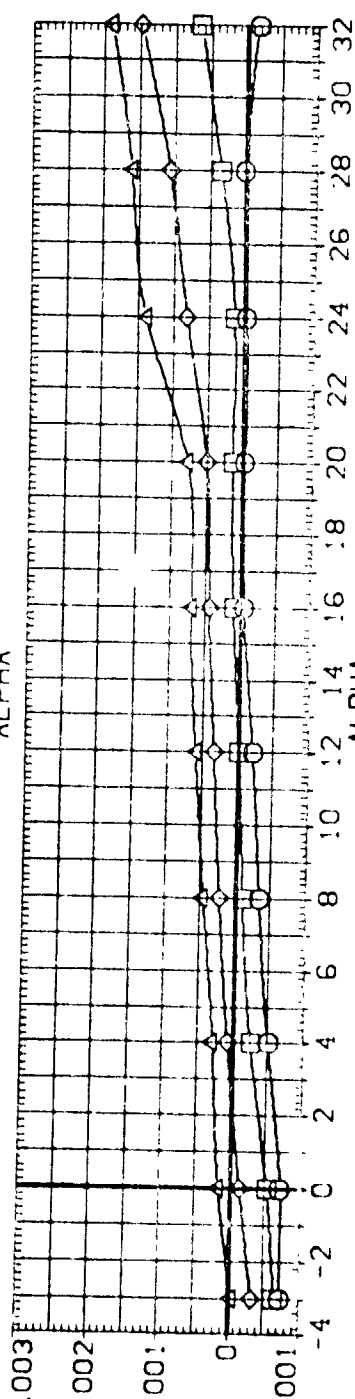
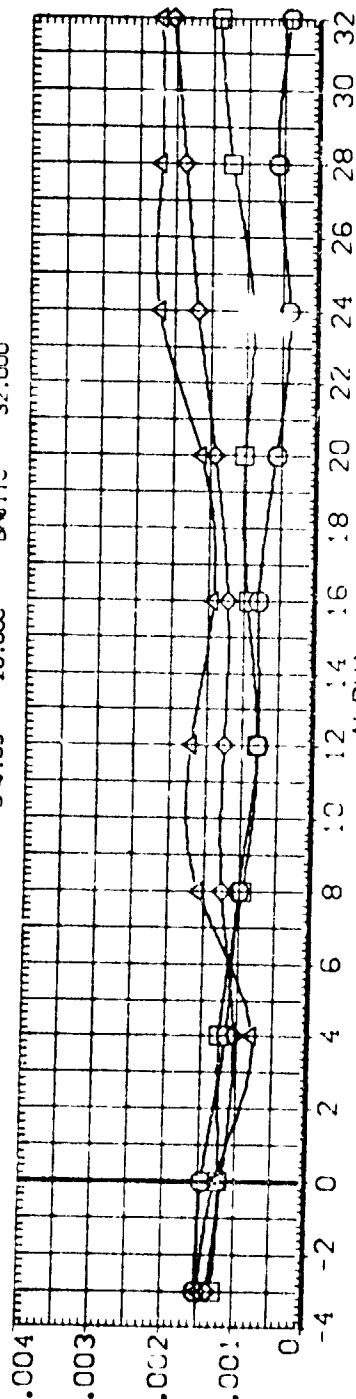


FIGURE 8. INBOARD ELEVON PITCH CONTROL EFFECTIVENESS

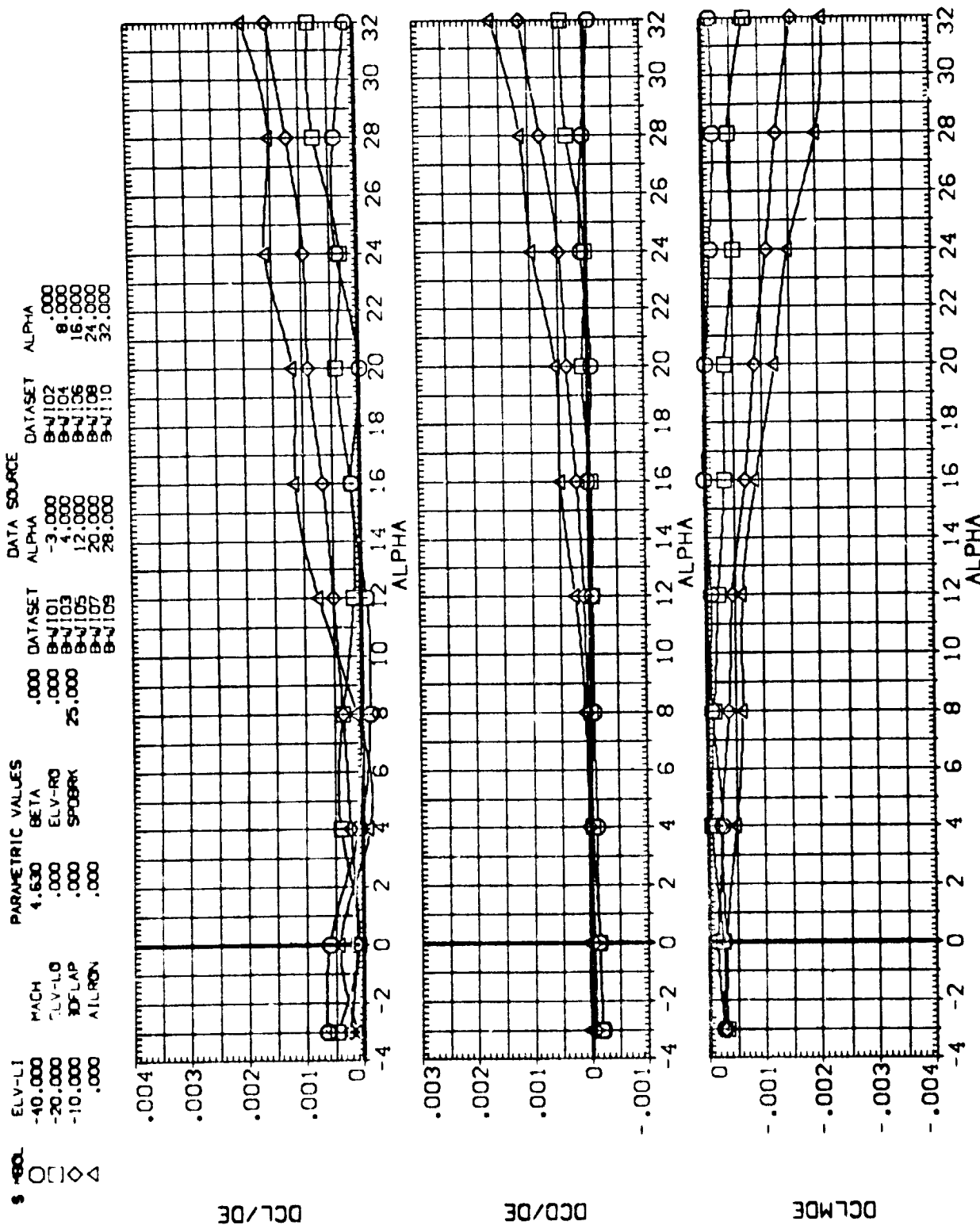


FIGURE 8. INBOARD ELEVON PITCH CONTROL EFFECTIVENESS

LA-49 UPAR 1101 RI-089B/139 ORR SPLIT ELEVON (RHJ001)

SYMBOL
 ○ □ ◇ △

ALPHA
 -4.172
 -0.012
 4.020
 8.106
 12.312

PARAMETRIC VALUES
 MACH 2.500
 ELV-LI .000
 BDFLAP .000
 ATRON .000

DATA SOURCE
 DATASET ELV-LI
 .000 RHJ001
 .000 R-3009
 25.000 R-3009

DATA SOURCE
 DATASET ELV-LI
 RHJ008 -10.000
 RHJ010 -40.000

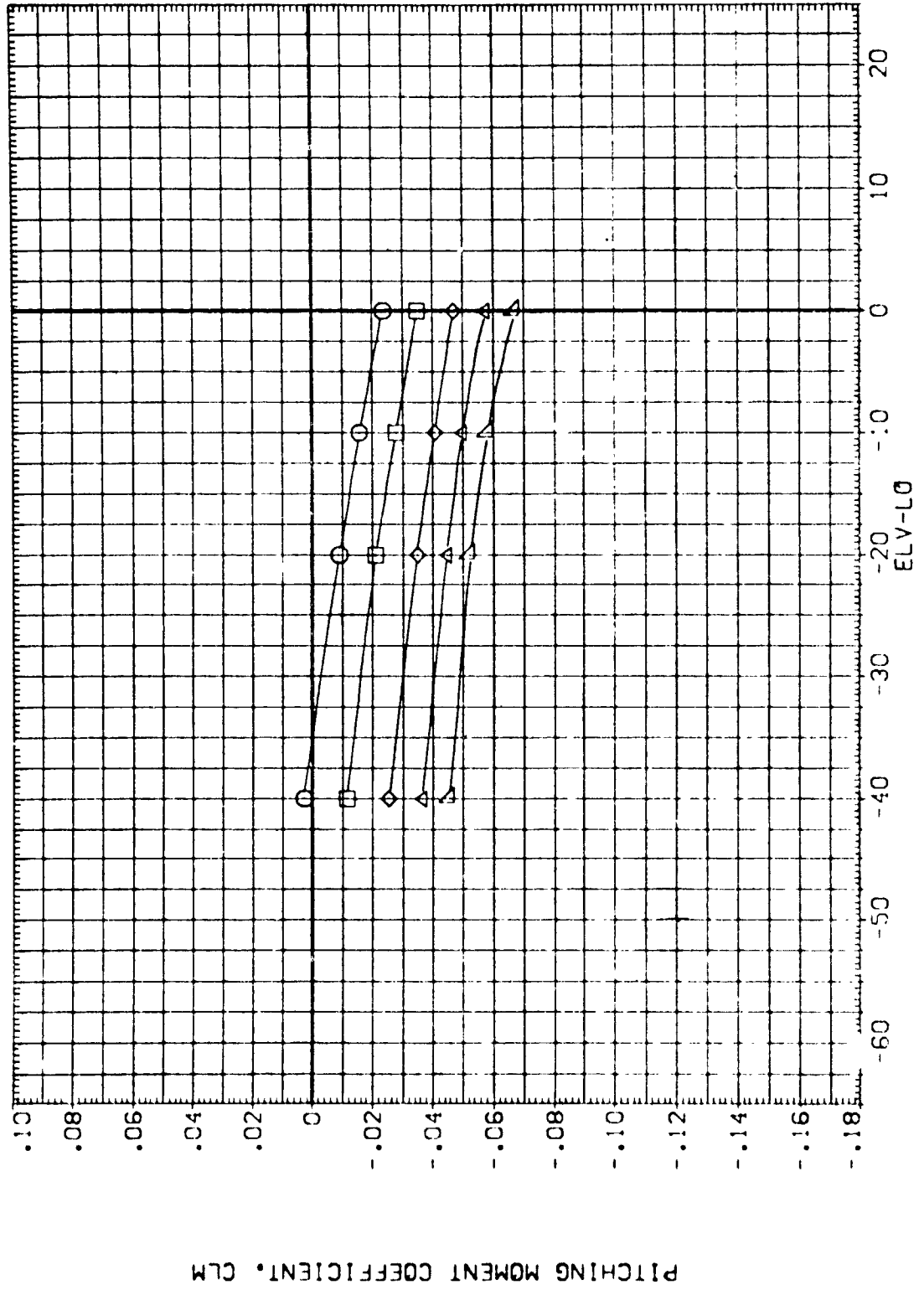


FIGURE 9. AUTOMATIC ELEVON PITCH CONTROL EFFECTIVENESS

LA-49 LPWT 1101 RI-089B/139 ORB SPLIT ELEVON (RHJ001)

SYMBOL
 ○ □ ◇ △

ALPHA
 16.792
 20.408
 24.504
 28.669
 32.717

PARAMETRIC VALUES
 MACH 2.500
 ELV-LI .000
 BDFLAP .000
 AILRON .000

DATA SOURCE
 DATASET ELV-LI
 .000
 R4J001
 .000
 R4J009
 .000
 R4J010
 .000

ELV-LI
 -10.000
 -40.000

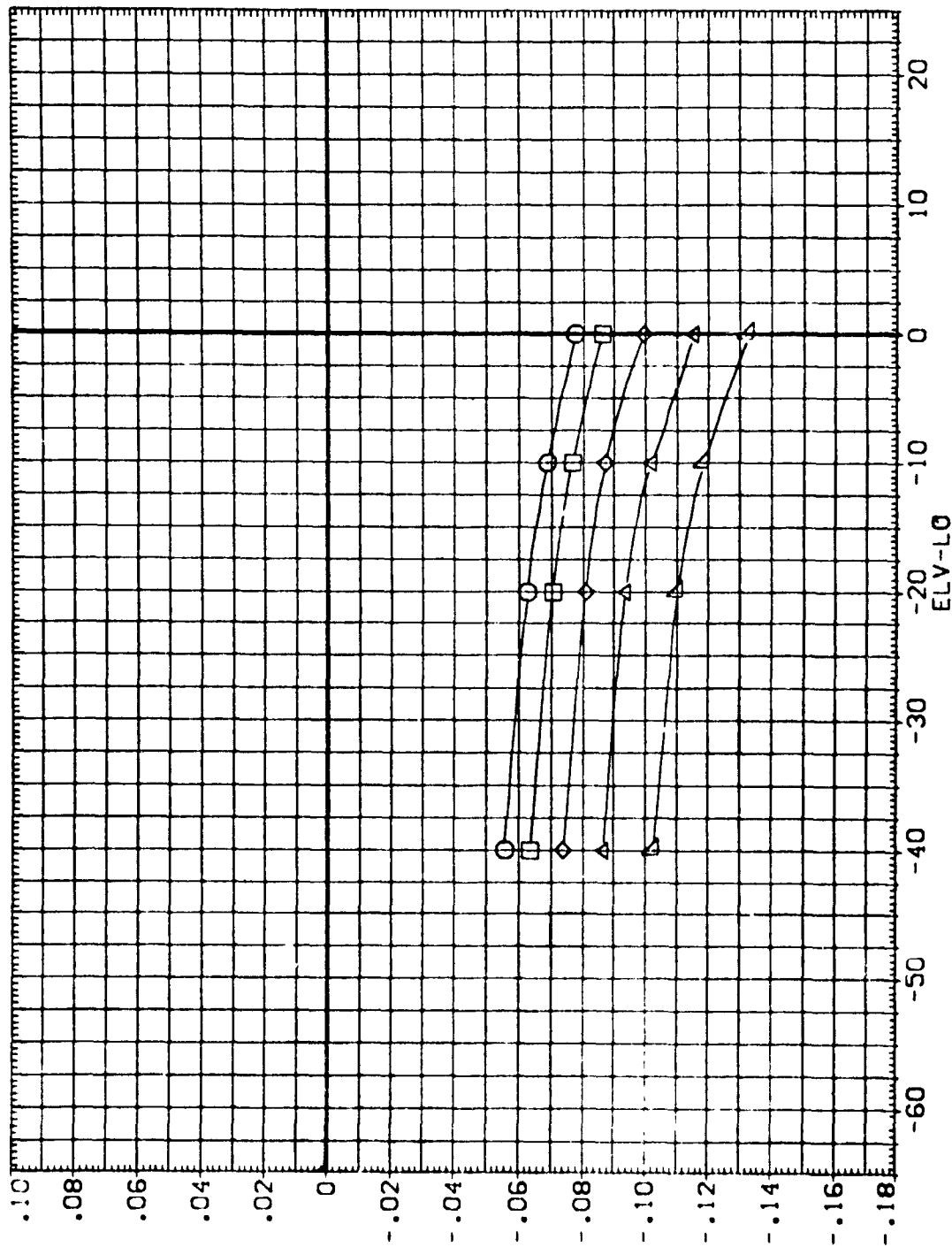


FIGURE 9. OUTBOARD ELEVON PITCH CONTROL EFFECTIVENESS

LA-49 C-27 1101 RI-089B/139 ORB SPLIT ELEVON (RHJ001)

SYMBOL

ALPHA
-3.548
-1.553
.433
2.462
4.466

MACH
ELV-LI
BOFLAP
ATL-RON

PARAMETRIC VALUES
4.600 BETA
.000 ELV-RI
.000 SPORR

.000 DATASET
.000 R-4001
25.000 R-4009

DATA SOURCE
ELV-L0
-20.000
R-4008
R-4010

DATASET
ELV-L0
-10.000
R-4008
R-4010

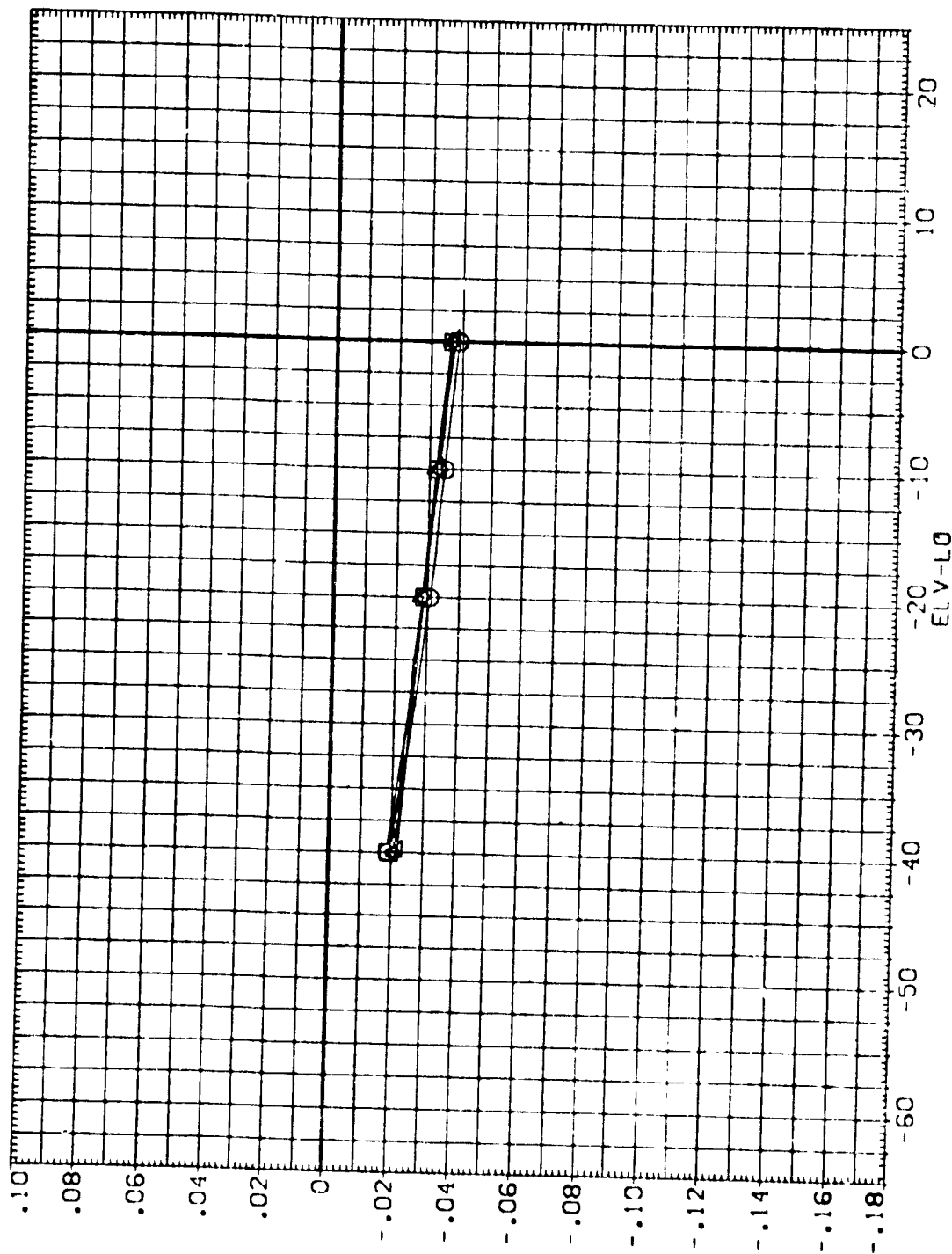


FIGURE 9. OUTBOARD ELEVON PITCH CONTROL EFFECTIVENESS

LA-49 UPWT 1101 RI-089B/139 ORB SPLIT ELEVON (RHJ001)

SYMBOL

ALPHA
8.540
12.575
16.602
20.646
24.715

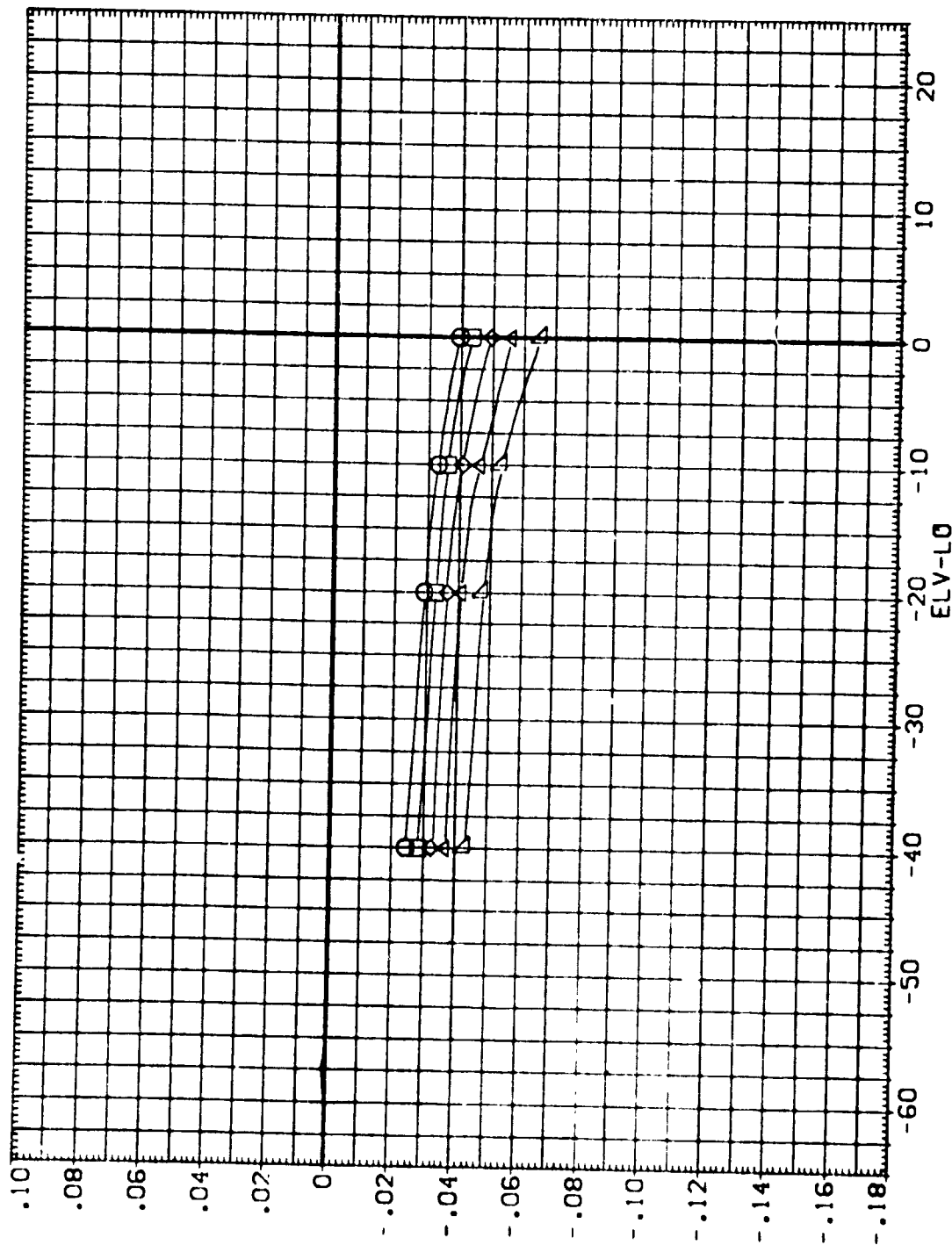
PARAMETRIC VALUES

MACH
ELV-L1
BOTLAP
AILRON

BETA
ELV-R1
SPDRK

DATA SOURCE

.000 DATASET ELV-L0 DATASET ELV-L0
.000 RHJ001 .000 RHJ008
25.000 RHJ009 -20.000 RHJ010



PITCHING MOMENT COEFFICIENT, CLM

FIGURE 9. OUTBOARD ELEVON PITCH CONTROL EFFECTIVENESS



LA-49 UPWT 1101 RI-0898/139 ORB SPLIT ELEVON (RHJ001)

SYMBOL

○
◇
△

ALPHA
28.780
32.804
36.891
40.981

PARAMETRIC VALUES
MACH
4.600
ELV-LI
ELV-LI
BOFLAP
AILRON

BETA
ELV-LI
SPGRK
25.000
25.000
25.000

DATA SOURCE
ELV-LI
RHJ001
RHJ010
RHJ008
RHJ010

ELV-LI
-10.000
-40.000

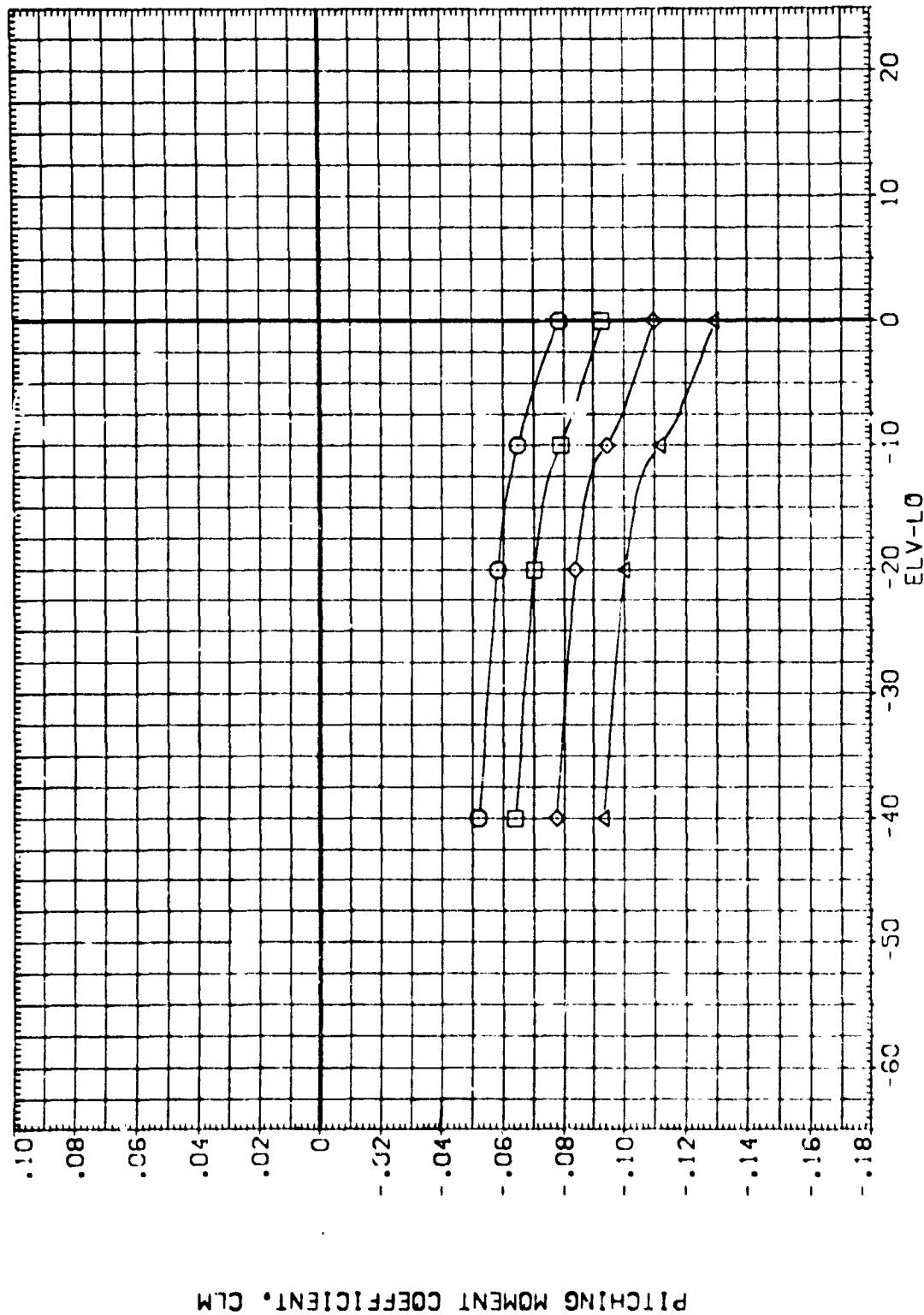


FIGURE 9. OUTBOARD ELEVON PITCH CONTROL EFFECTIVENESS

LA-49 UPWT 1101 RI-0898/139 ORB SPLIT ELEVON (8HJ001)

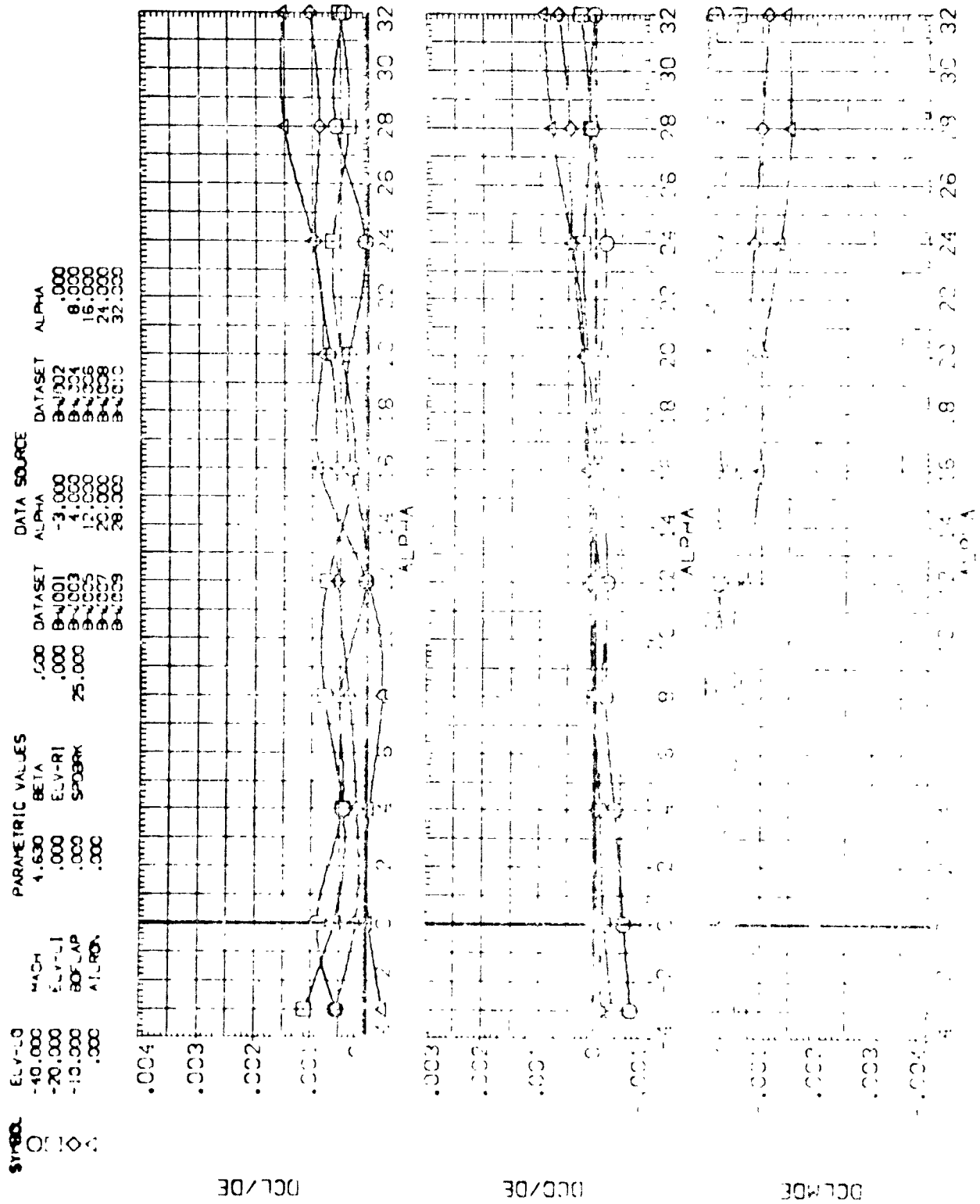


FIGURE 3. 100-10 PULSED-RI-0898/139 ORB SPLIT ELEVON

DATA SET SYMBOL CONFIGURATION DESCRIPTION ELV-L3 ELV-L1 ELV-R1 ELV-R0

(C) 005 □ A-19 101 R1-0858/139 088 SP-11 ELEVEN

(C) 007 □ A-19 101 R1-0858/139 088 SP-11 ELEVEN

(C) 008 □ A-19 101 R1-0858/139 088 SP-11 ELEVEN

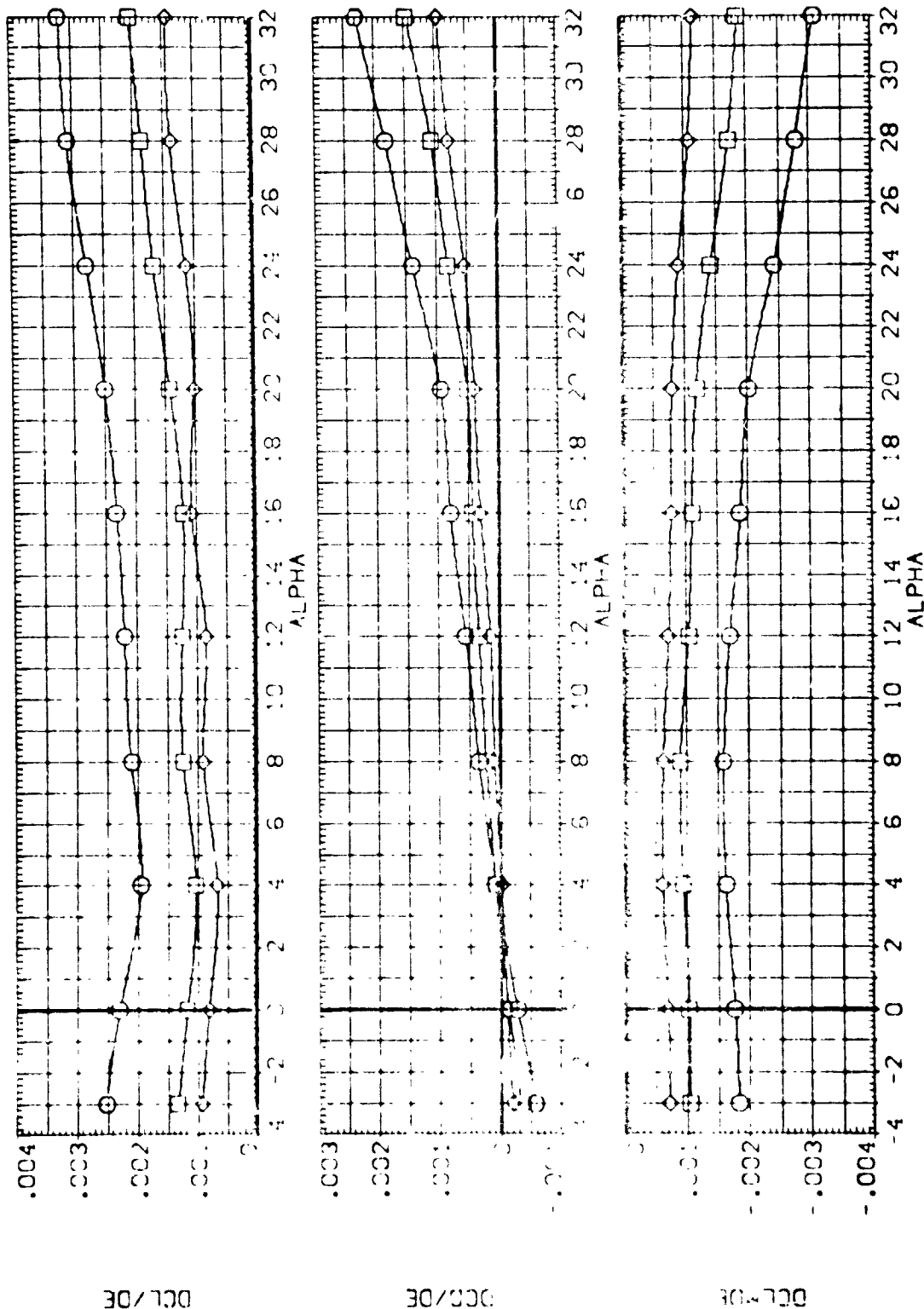


FIGURE 10. COMPARISON OF FULL SPAN, INBOARD AND OUTBOARD PITCH CONTROL (DE=-10)
(A) MACH = 2.50



DATA SET SYMBOL: CONFIGURATION DESCRIPTION

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ELV-L0	ELV-L1	ELV-R1	ELV-R0
Q	A-19 LUT 1101 R1-0893/139	-10.000	-10.000	-10.000	-10.000
Q	A-19 LUT 1101 R1-0893/139	-10.000	-10.000	-10.000	-10.000
Q	A-19 LUT 1101 R1-0893/139	-10.000	-10.000	-10.000	-10.000

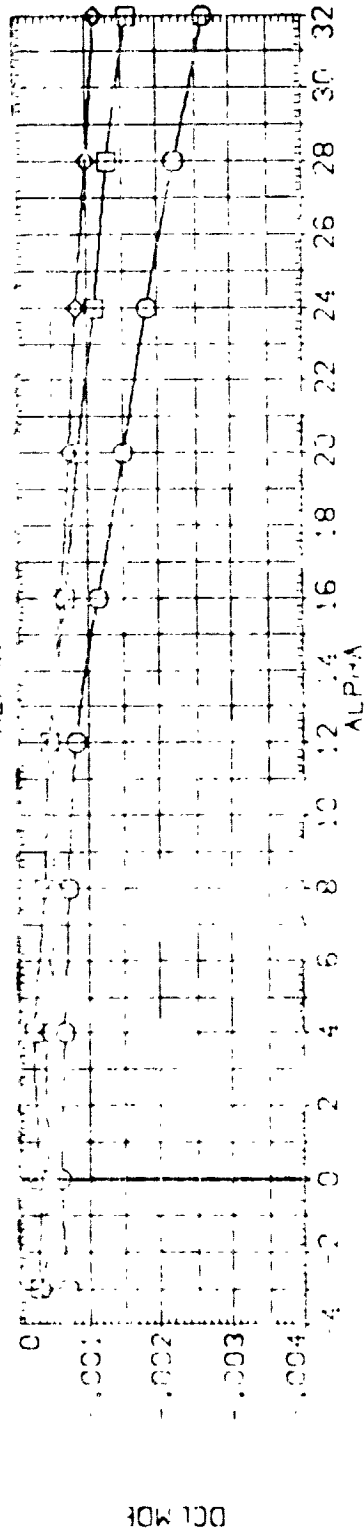
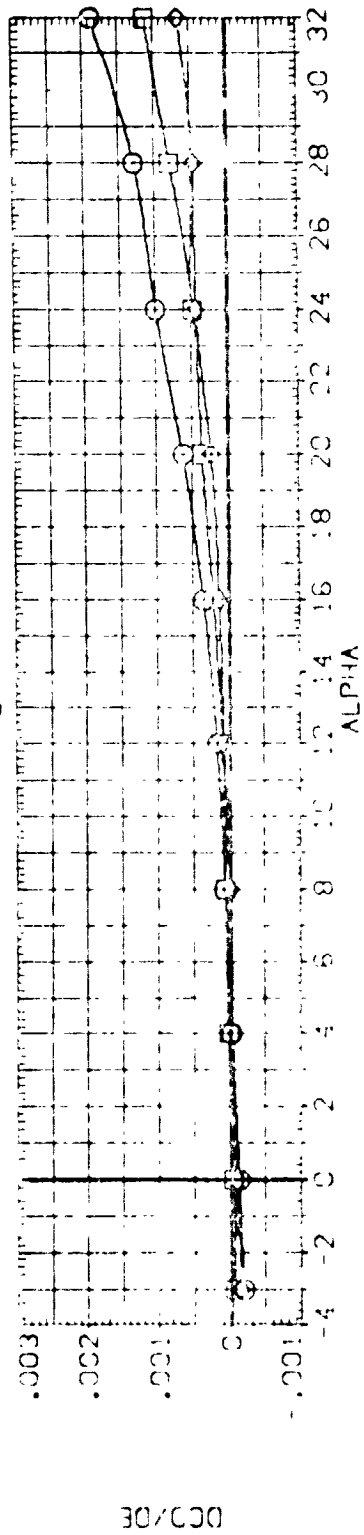
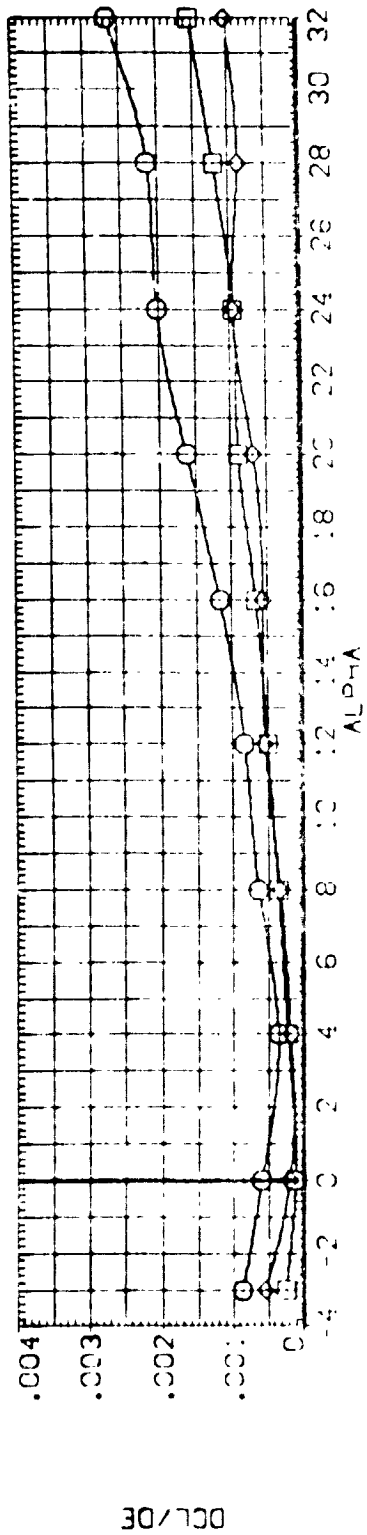


FIGURE 10. COMPARISON OF FULL SPAN, INBOARD AND OUTBOARD PITCH COEFFICIENTS (DE=-10)

DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (DN006) Q LA-19 JVT 101 R 0898/39 ORB SPLIT ELEVON
 (DN003) Q LA-19 JVT 101 R 0898/39 ORB SPLIT ELEVON
 (DN009) Q LA-19 JVT 101 R 0898/39 ORB SPLIT ELEVON

ELV-L0 ELV-L1 ELV-R1 ELV-R0
 -20.000 -20.000 -20.000 -20.000
 -20.000 -20.000 -20.000 -20.000
 -20.000 -20.000 -20.000 -20.000

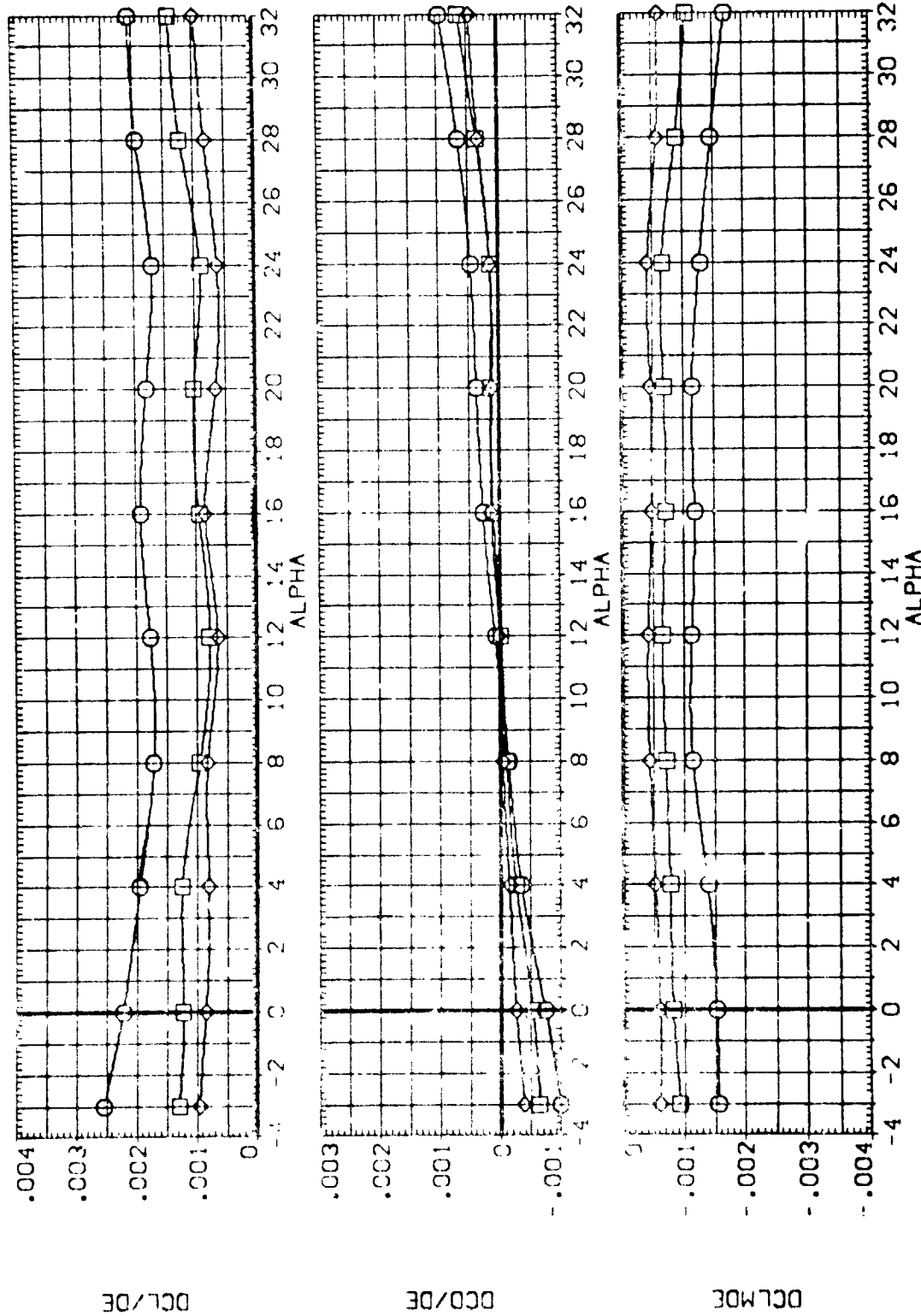


FIGURE 11. COMPARISON OF FULL SPAN, INBOARD AND OUTBOARD PITCH CONTROL (DE=-20)
 (A)MACH = 2.50

REPRODUCTION
 ORIGINAL



DATA SET SYMBOL CONFIGURATION DESCRIPTION ELV-L0 ELV-L1 ELV-R1 ELV-R0
 (C-006) Q LA-49 UPAT [10] R [-0898/139] 088 SPL IT ELEVON -20.000 -20.000 -20.000 -20.000
 (C-003) Q LA-49 UPAT [10] R [-0898/139] 088 SPL IT ELEVON -20.000 -20.000 -20.000 -20.000
 (C-009) Q LA-49 UPAT [10] R [-0898/139] 088 SPL IT ELEVON -20.000 -20.000 -20.000 -20.000

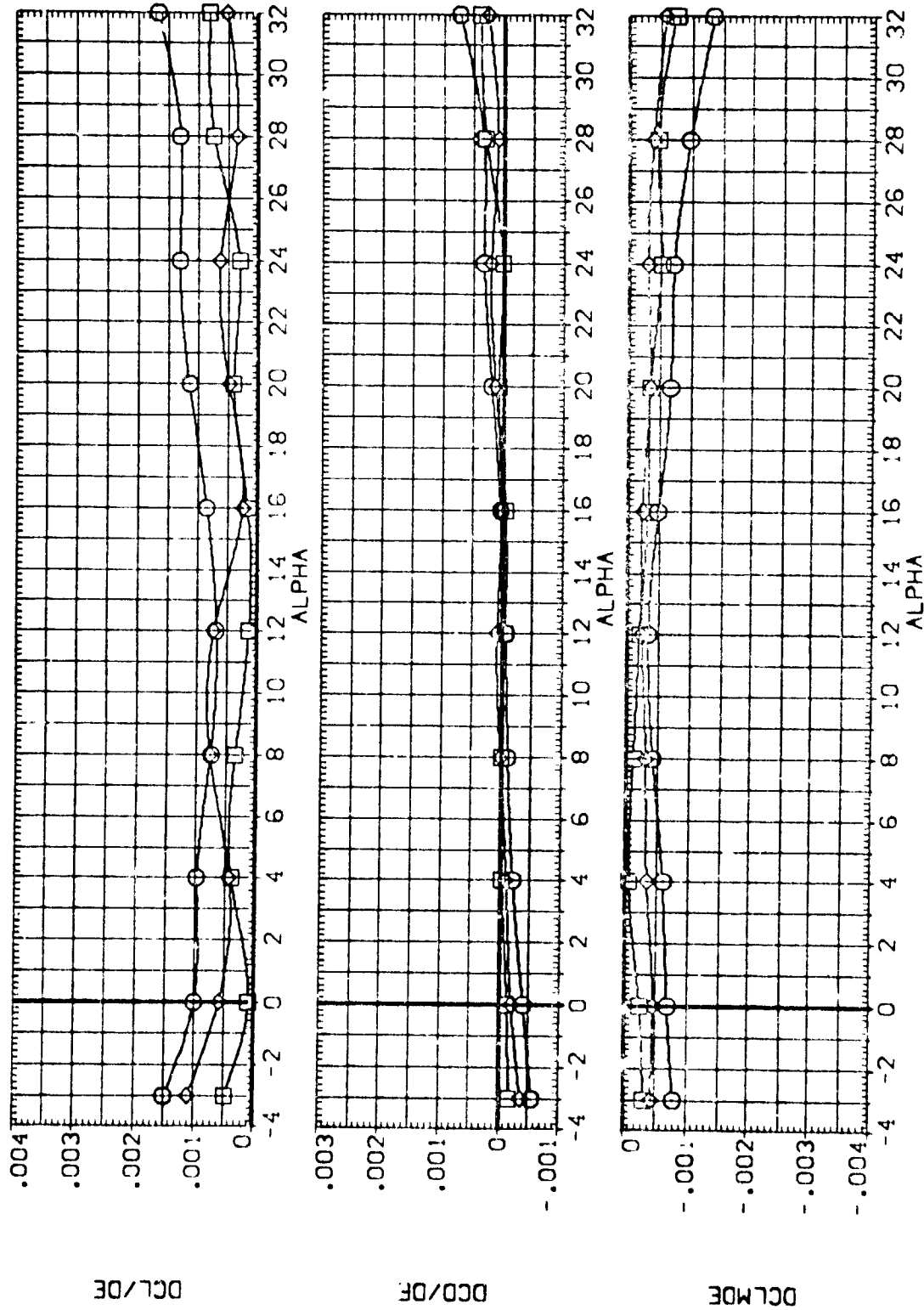


FIGURE 11. COMPARISON OF FULL SPAN, INBOARD AND OUTBOARD PITCH CONTROL (DE=-20)
 (B)MACH = 4.63

DATA SET SYMBOL	CONF	DESCRIPTION	ELV-L0	ELV-L1	ELV-R1	ELV-R0
(C4-007)	LA-49	UPVT	-40.000	-40.000	-40.000	-40.000
(C4-004)	LA-49	UPVT	-40.000	-40.000	-40.000	-40.000
(C4-010)	LA-49	UPVT	-40.000	-40.000	-40.000	-40.000

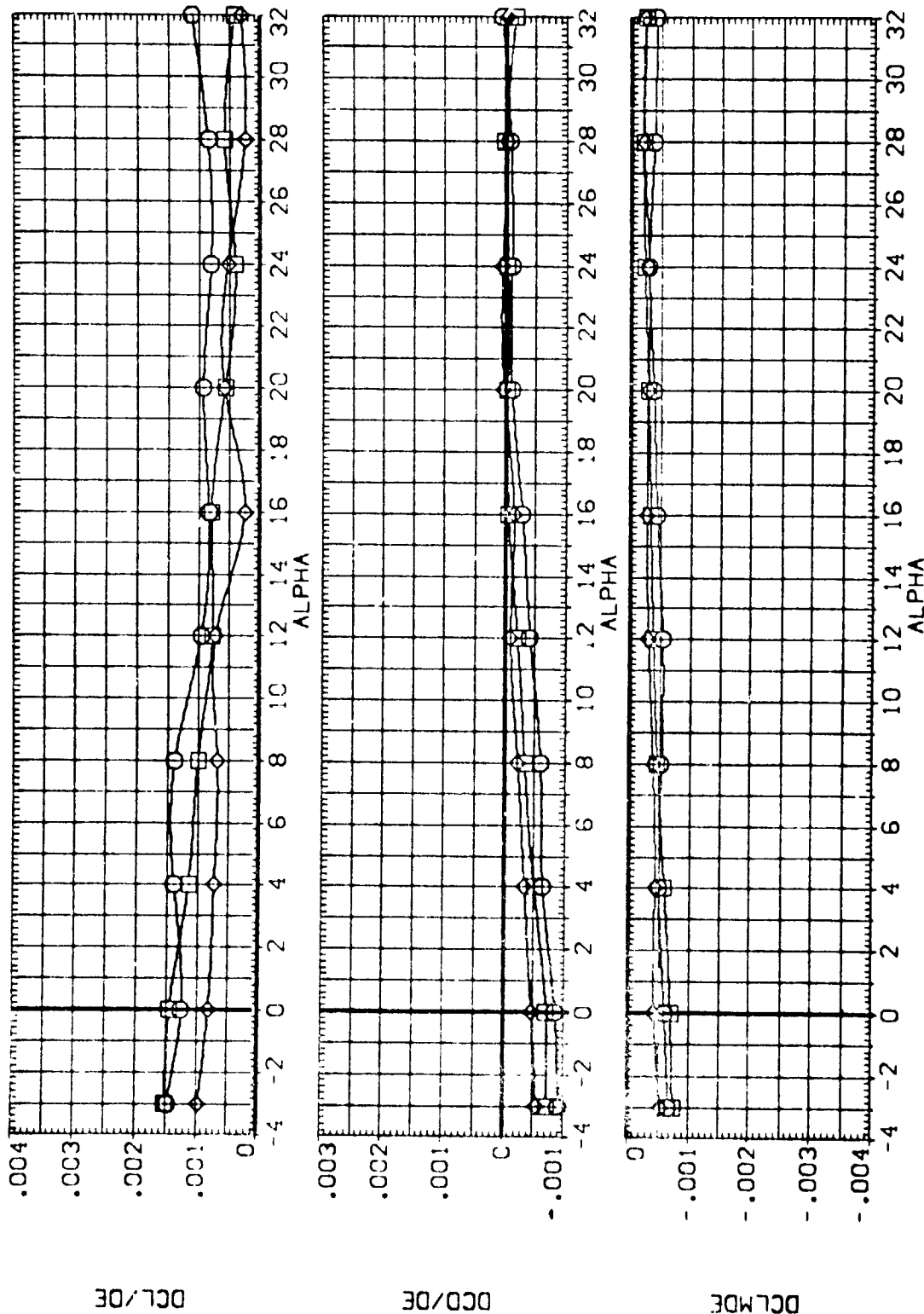


FIGURE 12. COMPARISON OF FULL SPAN, INBOARD AND OUTBOARD PITCH CONTROL (DE=-40)

(A)MACH = 2.50

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ELV-L0	ELV-L1	ELV-R1	ELV-R0
(CN007)	LA-19 UPVT 1101 RI-0898/139 OR8 SPLIT ELEVON	-40.000	-40.000	-40.000	-40.000
(CN004)	LA-19 UPVT 1101 RI-0898/139 OR8 SPLIT ELEVON	.000	-40.000	-40.000	.000
(CN010)	LA-19 UPVT 1101 RI-0898/139 OR8 SPLIT ELEVON	-40.000	.000	.000	-40.000

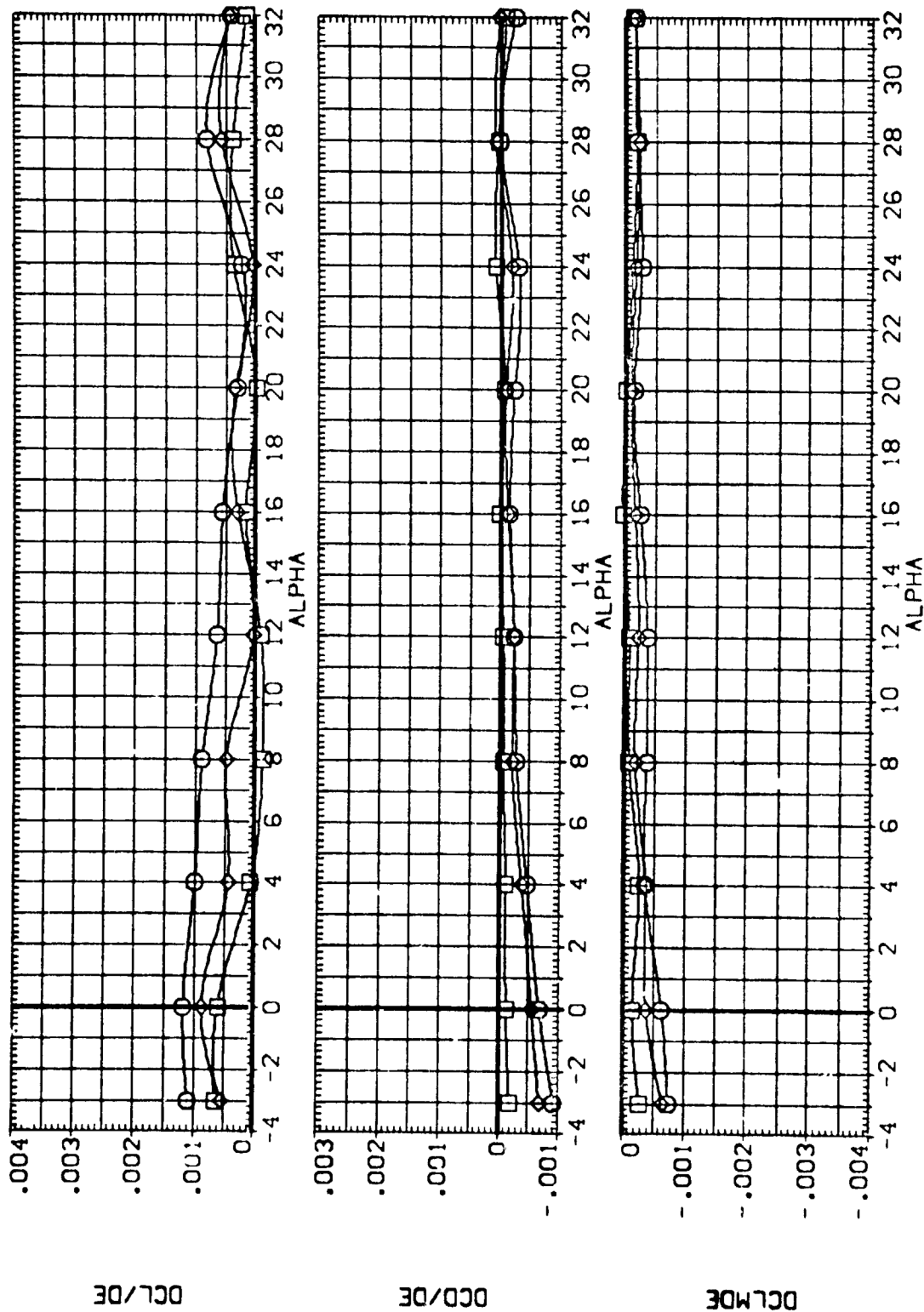


FIGURE 12. COMPARISON OF FULL SPAN. INBOARD AND OUTBOARD PITCH CONTROL (CE=-40)

(B)MACH = 4.63

DATA SET SYMBOL: 8
 CONFIGURATION DESCRIPTION: LA-18 UPVT 1101 RI-0898/139 ORG SPLIT ELEVON ORG SPLIT ELEVON
 ELV-LO ELV-LI ELV-RI ELV-RO
 10.000 -20.000 -20.000 -10.000
 10.000 -40.000 -40.000 -10.000

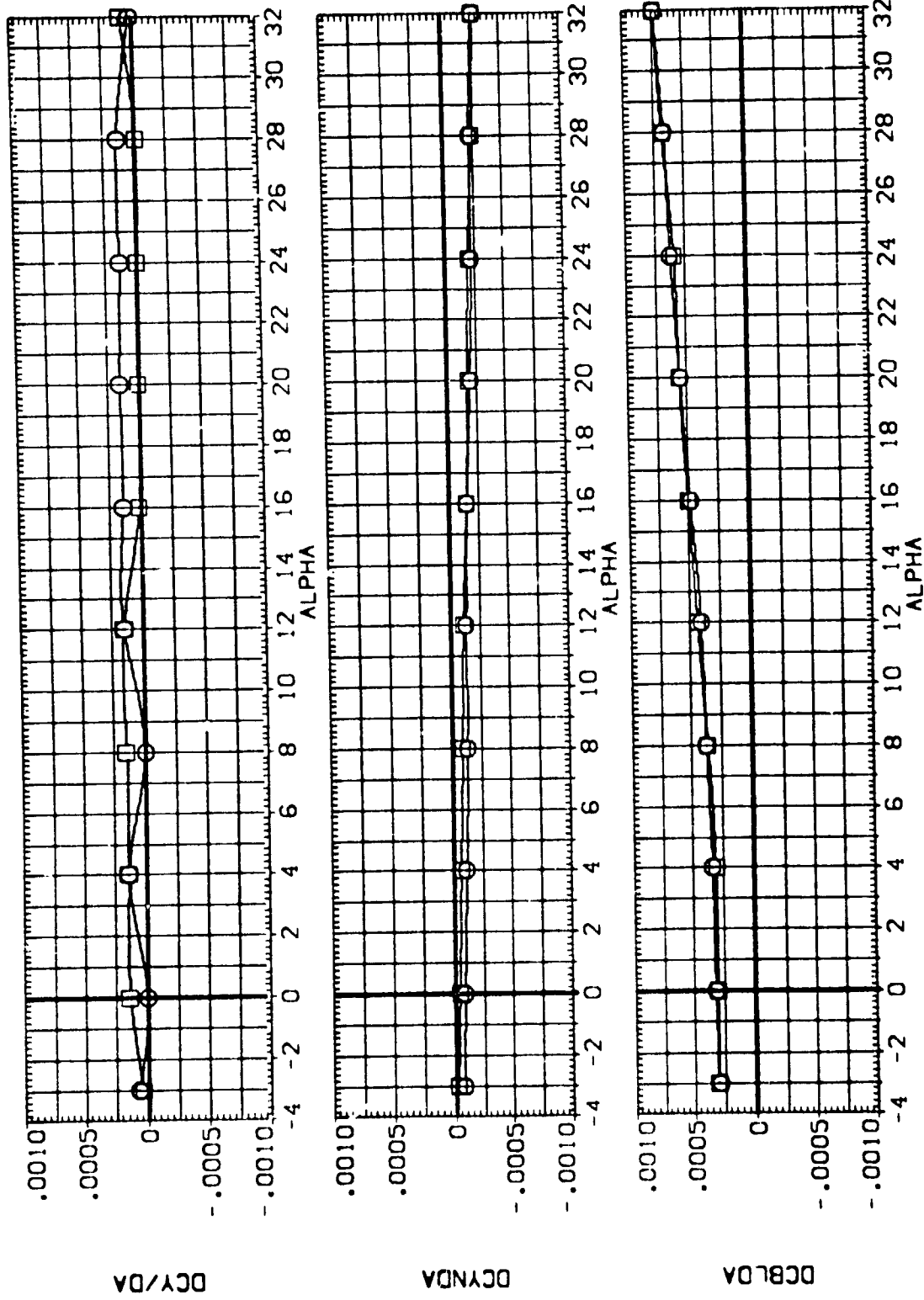


FIGURE 13. OUTBOARD AILERON EFFECTIVENESS WITH INBOARD ELEVONS DEFLECTED

(A)MACH = 2.50

DATA SET SYMBOL CONFIGURATION DESCRIPTION
 [94016] [84017] LA-49 JPT [10] RI-0898/139 OF8 SPL IT ELEVON
 [84017] LA-49 JPT [10] RI-0898/139 OF8 SPL IT ELEVON

ELV-LO ELV-LI ELV-RI ELV-RO
 10.000 -20.000 -20.000 -10.000
 10.000 -40.000 -40.000 -10.000

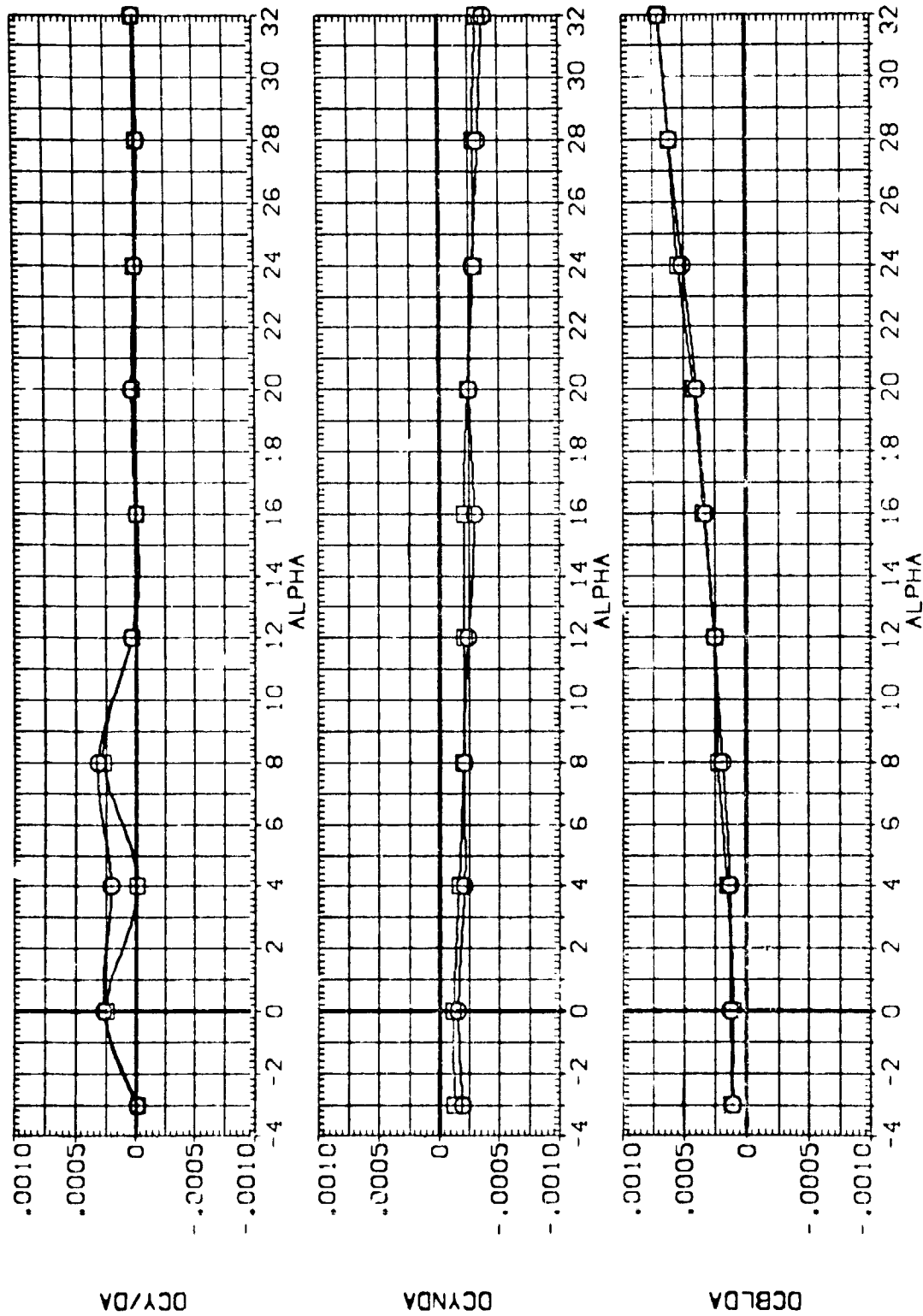


FIGURE 13. OUTBOARD AILERON EFFECTIVENESS WITH INBOARD ELEVONS DEFLECTED

(3) MAC = 4.63

DATA SET SYMBOL: 9
 [8-1011] [8-1013]
 CONFIGURATION DESCRIPTION: LA-19 UPVT 1101 RI-0898/139 ORB SPL IT ELEVON
 LA-19 UPVT 1101 RI-0898/139 ORB SPL IT ELEVON
 ELV-L0 ELV-L1 ELV-R1 ELV-R0
 .000 .000 -20.000 -20.000
 .000 -10.000 -10.000 -20.000

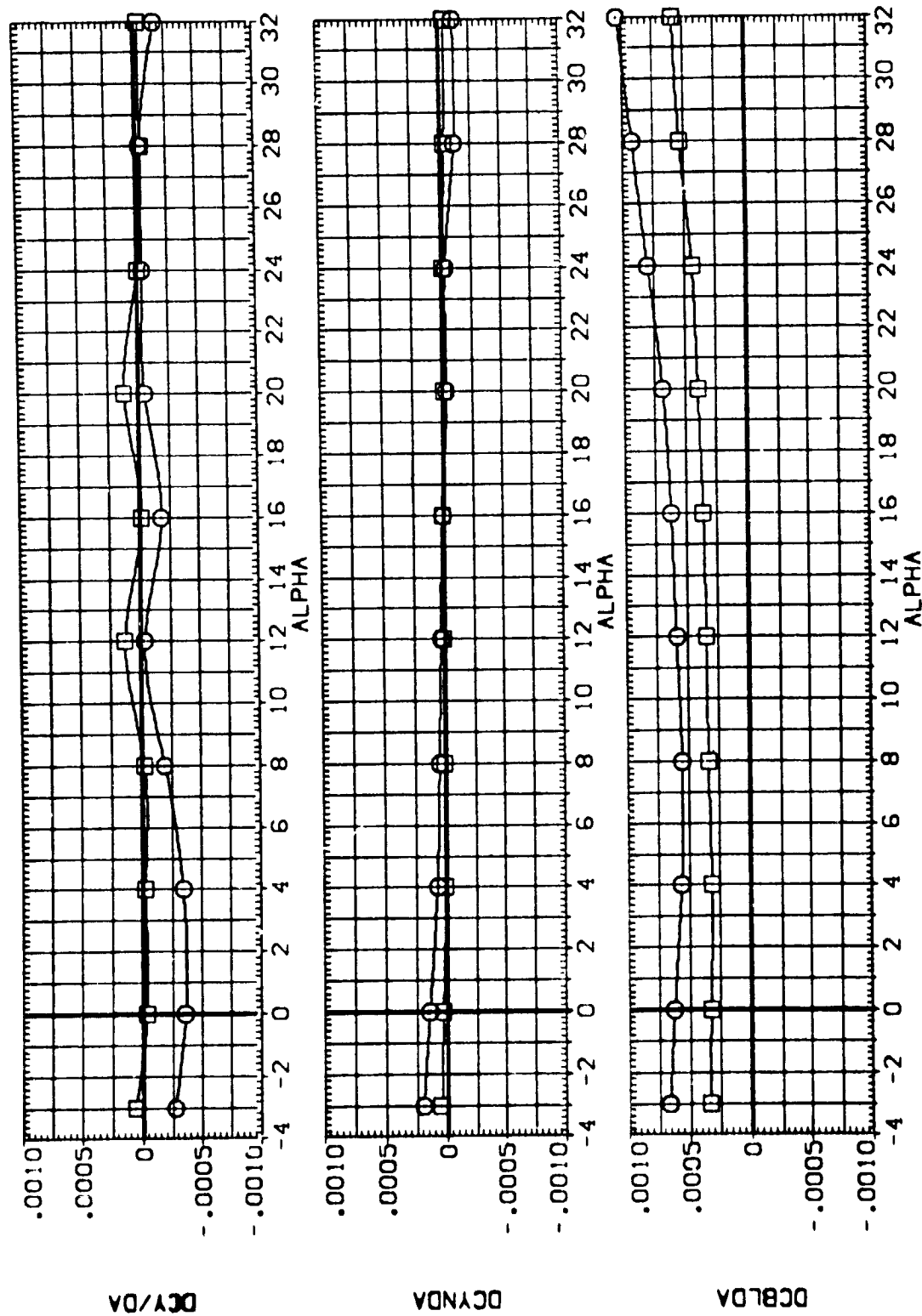


FIGURE 14. COMPARISON OF FULL SPAN AND OUTBOARD ELEVON DEFLECT. FOR ROLL (DE=-10)
 (A)MACH = 7 50 PAGE 42



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (3) 011 (3) 011 RI 0890/139 018 CAL IT ELEVON
 (B) 213 (B) 213 RI 0838/139 018 CAL IT ELEVON

ELV-L0 ELV-L1 ELV-R1 ELV-R0
 .000 .000 -10.000 -20.000
 .000 -10.000 -20.000

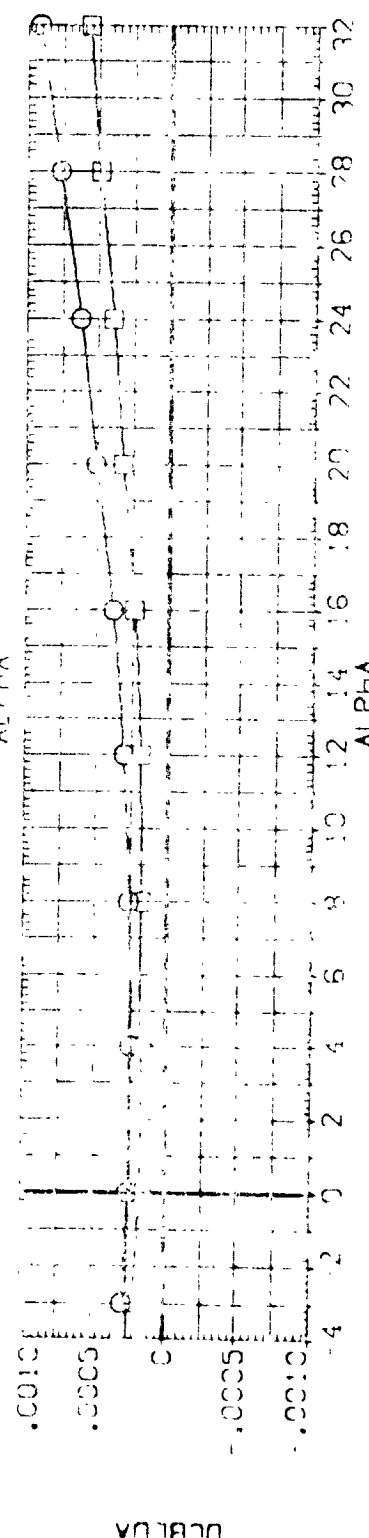
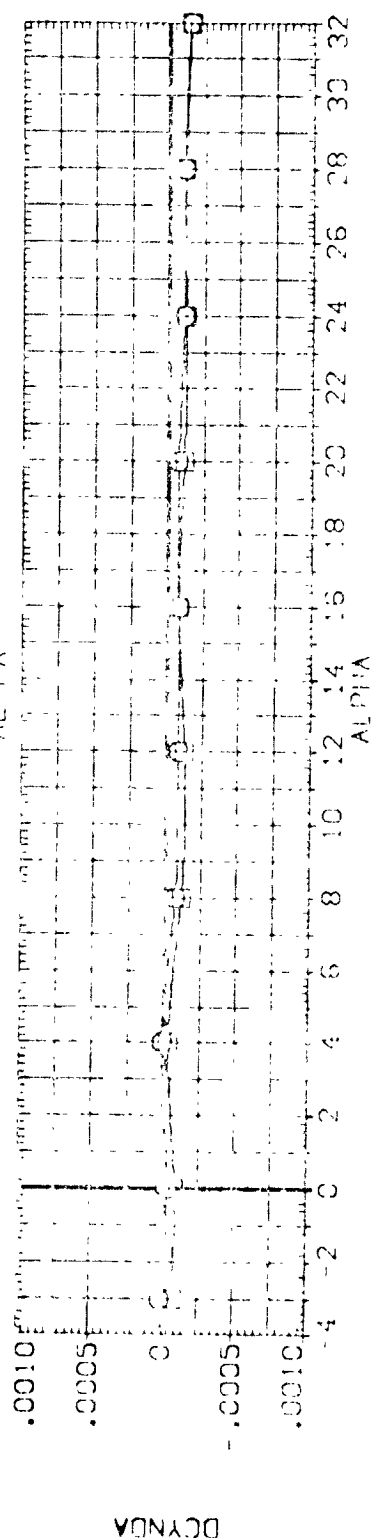
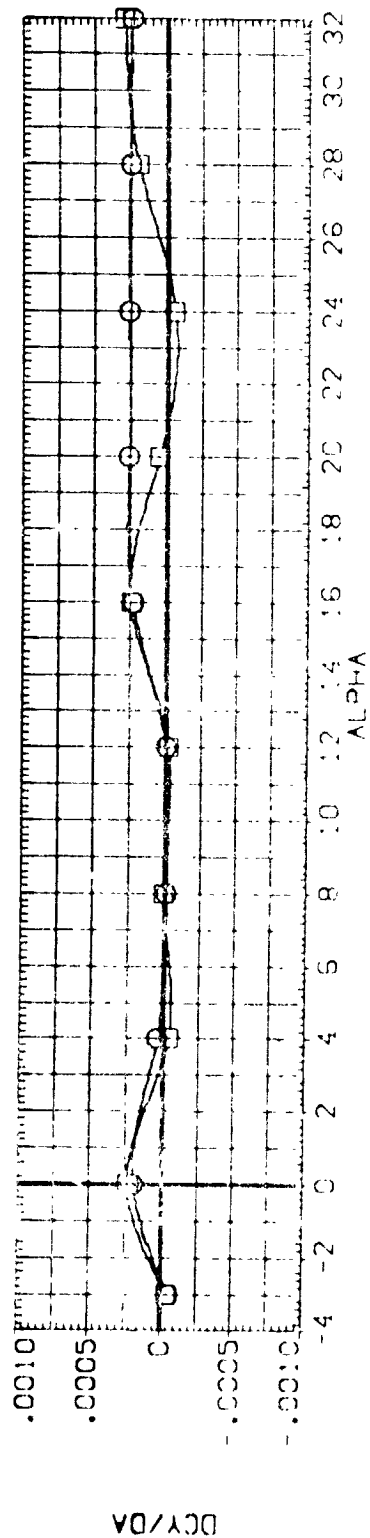
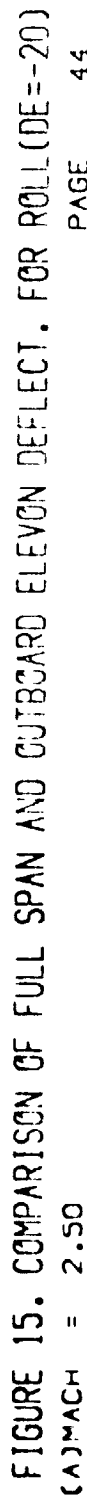


FIGURE 14. COMPARISON OF FULL SPIN AND OUTWARD ELEVON EFFECT, FOR ROLL (DE=-10)
 (3)MAC = 4.63

CONFIGURATION DESCRIPTION



DATA SET	SYMBOL	CONFIGURATION	DESCRIPTION	ELV-L0	ELV-L1	ELV-R1	ELV-R0
(9~012)	Q	LA-49	UPVT	10.000	-10.000	-30.000	-30.000
(9~015)	Q	LA-49	UPVT	-10.000	-20.000	-20.000	-30.000
(9~016)	Q	LA-49	UPVT	10.000	-20.000	-20.000	-10.000

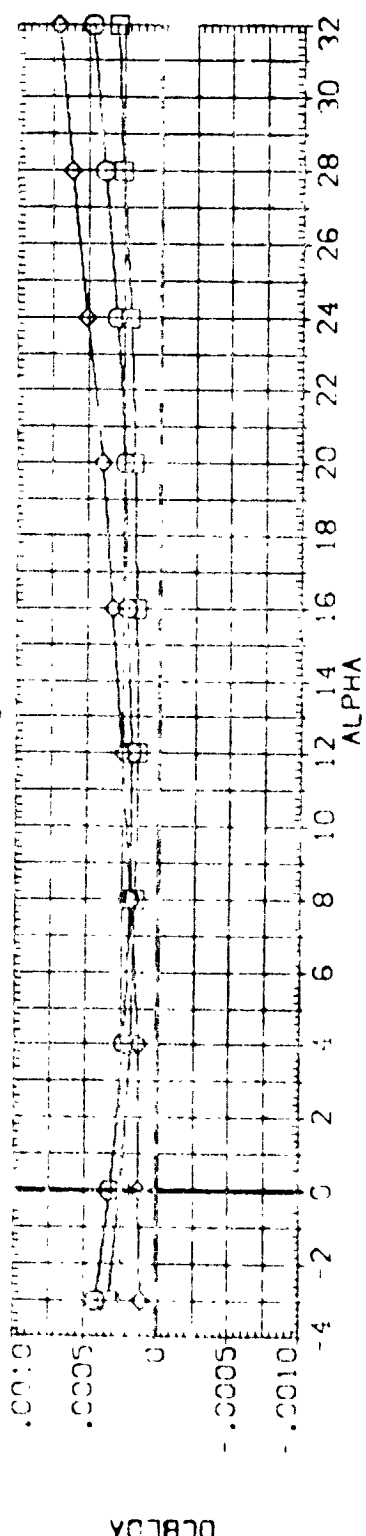
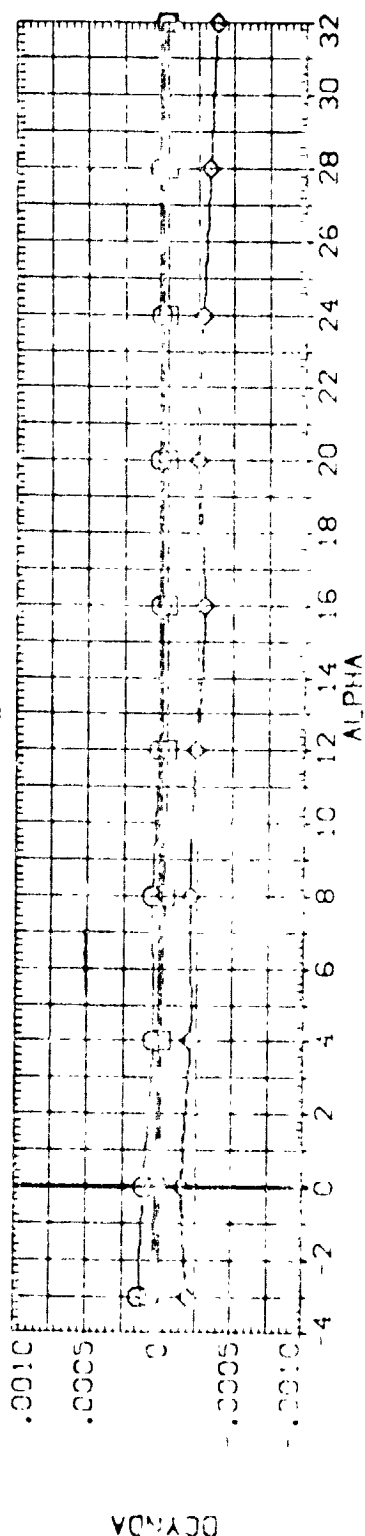
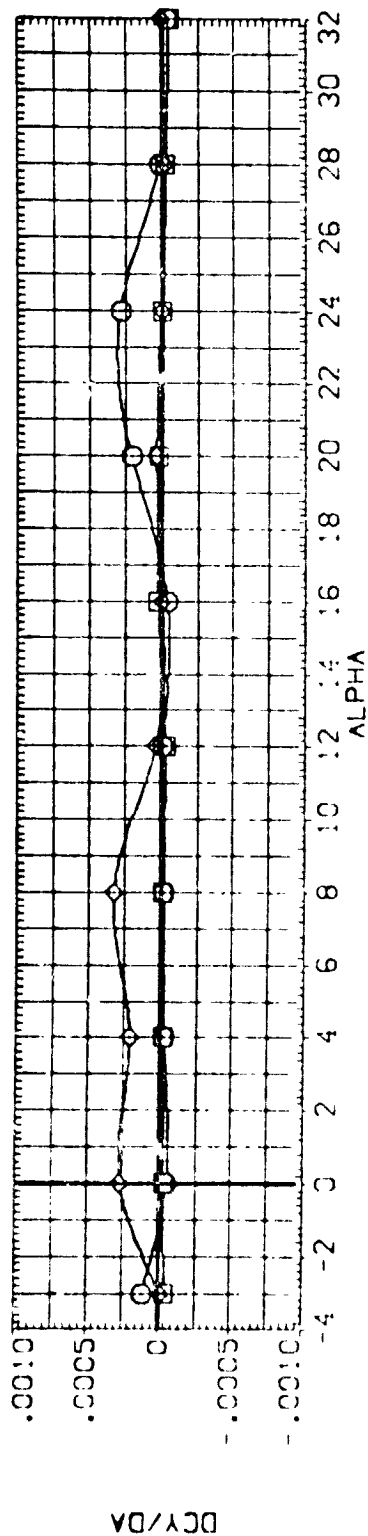


FIGURE 15. COMPARISON OF FULL SPAN AND OUTBOARD ELEVON DEFLECT. FOR R01 (DE=-20)

(B)MACH = 4.63

DATA SET SYMBOL CONFIGURATION DESCRIPTION ELV-LO ELV-LI ELV-RI ELV-RO
 (003) LA-19 001 R1-0898/139 098 SPL IT ELEVON -10.000 -10.000 -10.000 -10.000
 (006) LA-19 001 R1-0898/139 098 SPL IT ELEVON -20.000 -20.000 -20.000 -20.000
 (007) LA-19 001 R1-0898/139 098 SPL IT ELEVON -40.000 -40.000 -40.000 -40.000

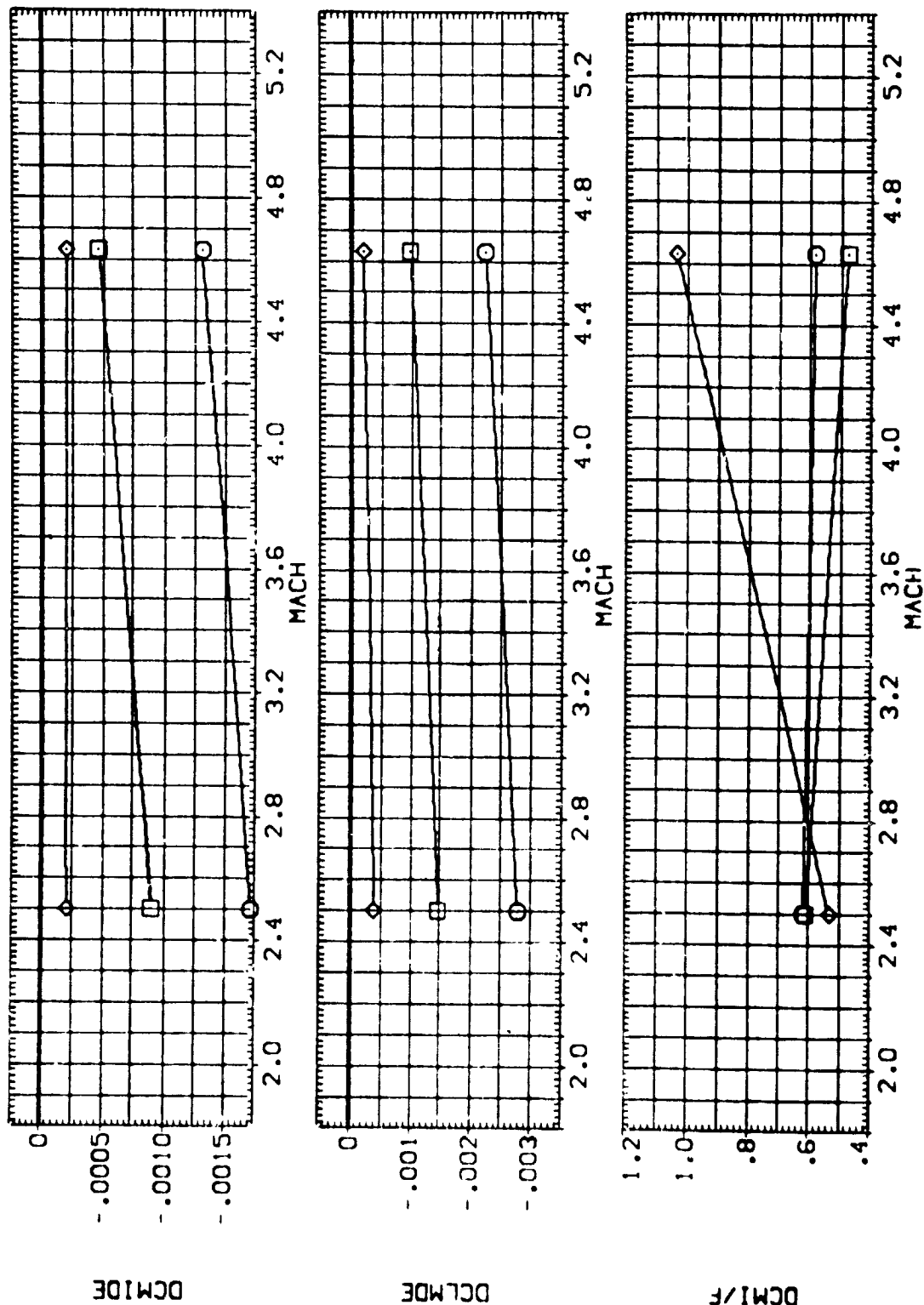


FIGURE 16. COMPARISON OF CONTROL EFFECTIVENESS FOR FULL SPAN AND INBD. ELEVON

(A) ALPHA = 28.00

DATA SET SYMBOL CONFIGURATION DESCRIPTION
 [111005] Q A-19 UPAT 01 R1-0698/39 098 SP-17 ELEVON
 [111006] X A-19 UPAT 01 R1-0698/39 098 SP-17 ELEVON
 [111007] X A-19 UPAT 01 R1-0698/39 098 SP-17 ELEVON

ELV-L0 ELV-L1 ELV-R1 ELV-R0
 -10.000 -10.000 -10.000 -10.000
 -20.000 -20.000 -20.000 -20.000
 -40.000 -40.000 -40.000 -40.000

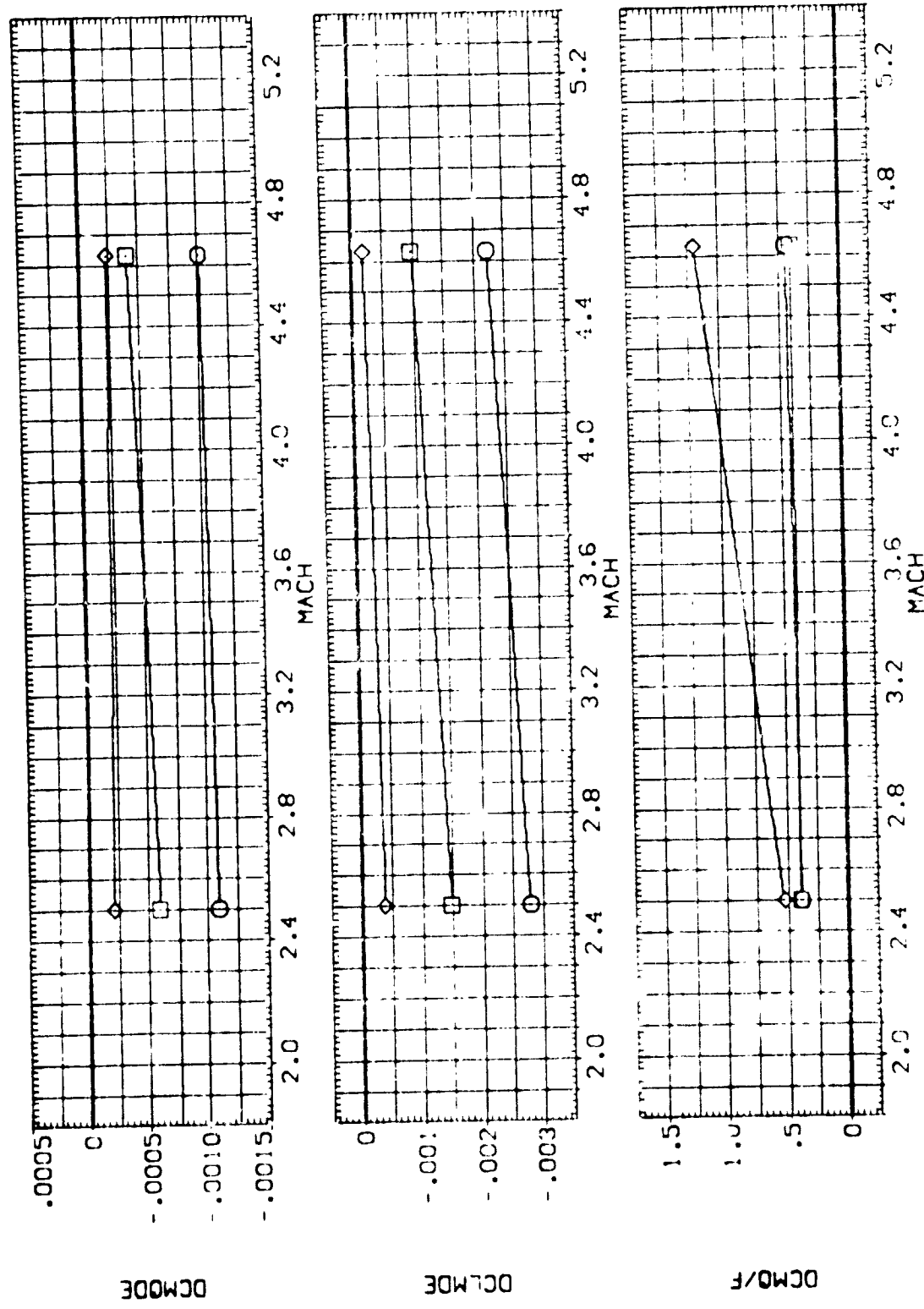



FIGURE 17. COMPARISON OF CONTROL EFFECTIVENESS FOR FULL SPAN AND OUTRD, ELEVON
 (A) ALPHA = 28.00

APPENDIX
TABULATED SOURCE DATA

Plotted data tabulation are available from the Chrysler DATAMAN system
on request.



LA-49 UNIT 1101 RI-0898/139 CRE SPLIT ELEVON

(RMJ001)

PARAMETRIC DATA

BETA	=	.000	ELV-LO	=	.000
ELV-L1	=	.000	ELV-R1	=	.000
ELV-R0	=	.000	EDFLAP	=	.000
SPECSK	=	25.000	ALLCON	=	.000
EVTR	=	.000			

1902

[illegible]

712

ALL

LA-49 LABULATED SOURCE DATA

PAGE 2

LA-49 UPM 1101 RI-0698/139 ORB SPL17 ELEVON

(RHJ002)

PAPAMETRIC DATA

BETA = .000 ELV-LO = .000
 ELV-LI = -10.000 ELV-RI = -10.000
 ELV-RO = .000 EDPLAP = .000
 SPOERK = 25.000 ELEVR = -10.000
 AIRRON = .000

RUN NO. 21/ 0

WACH	ALPHA	BETA	CN	CA	CLM	CL	CYN	CY	CL	CD	L/D
2.900	-4.046	.01908	-1.1434	.11883	-.01321	-.00147	.00048	-.00033	-.13471	.12875	-1.04624
2.900	-.008	.01942	-.00948	.11638	-.02344	-.00121	.00026	-.00044	-.00947	.11638	-.08135
2.900	4.036	.02033	.12569	.11443	-.03704	-.00113	-.00019	-.00113	.11832	.12307	.96139
2.900	8.136	.02078	.25952	.11275	-.04798	-.00102	-.00018	-.00170	.24095	.14834	1.62433
2.900	12.240	.02111	.39806	.11030	-.05493	-.00111	-.00018	-.00220	.36563	.19218	1.90247
2.900	16.299	.02117	.54746	.10801	-.06322	-.00119	-.00018	-.00234	.49315	.25731	1.92433
2.900	20.406	.02215	.70504	.10415	-.07216	-.00129	-.00018	-.00300	.62448	.34345	1.81828
2.900	24.563	.02153	.87321	.10126	-.08133	-.00111	.00004	-.00339	.75185	.45349	1.65056
2.900	28.652	.02147	1.04821	.09864	-.09475	-.00129	-.00030	-.00291	.87351	.58741	1.45705
2.900	32.779	.02128	1.23387	.09314	-.11175	-.00156	-.00016	-.00333	.98667	.74632	1.32244

RUN NO. 31/ 1

WACH	ALPHA	BETA	CN	CA	CLM	CL	CYN	CY	CL	CD	L/D
4.800	-3.544	.03927	-.10169	.09007	-.03599	-.00006	.00091	-.00410	-.09486	.09618	-.99674
4.800	-1.574	.04026	-.07821	.08652	-.03473	.00002	.00048	-.00562	-.05782	.08814	-.69599
4.800	.440	.03932	-.02257	.08345	-.03323	-.00004	.00048	-.00472	-.02321	.08327	-.27873
4.800	2.481	.03948	.52268	.08087	-.03169	-.00008	.00047	-.00339	.01915	.08178	.23423
4.800	4.409	.04001	.06011	.07776	-.03276	-.00031	.00046	-.00504	.06176	.08345	.74013
4.800	6.303	.04001	.17072	.07576	-.03400	-.00032	.00045	-.00505	.15770	.09977	1.37057
4.800	8.259	.04027	.28448	.07356	-.03717	-.00002	.00003	.00465	.26117	.13375	1.92397
4.800	10.390	.03917	.41414	.07176	-.04081	-.00017	.00044	.00396	.37490	.19209	1.93164
4.800	12.679	.04047	.56200	.07008	-.04445	-.00001	.00001	.00528	.49752	.27337	1.91991
4.800	15.175	.04084	.71759	.06805	-.05145	-.00019	-.00001	-.00634	.61724	.37508	1.54564
4.800	17.753	.04109	.88291	.06378	-.06036	-.00037	-.00023	-.00705	.73355	.49844	1.47169
4.800	20.422	.04022	1.05924	.05804	-.07322	-.00018	-.00042	-.00480	.84314	.64691	1.30333
4.800	23.154	.04115	1.24630	.05700	-.08677	-.00027	-.00041	-.00745	.94354	.81896	1.15212
4.800	26.927	.04110	1.42959	.05651	-.10309	-.00053	-.00040	-.00749	1.02132	1.00402	1.01743

LA49 TABULATED SOURCE DATA

LA-49 UPMF 1101 RI-0898/139 CR8 SPL117 ELEVON

(RHJ003)

PARAMETRIC DATA

BETA = .000 ELV-LO = .000
 ELV-L1 = -20.000 ELV-RI = -20.000
 ELV-RO = .000 EDFLAP = .000
 SPOBRK = 25.000 ELEVTR = -20.000
 ATLEON = .000

RUN NO. 22/ 0

WACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
2.500	-4.043	.02054	-1.1578	.12365	-.00292	-.00142	.00023	-.00235	-.14667	.13433	-1.09191
2.500	-1.021	.02026	-1.02190	.12005	-.01427	-.00144	.00001	-.00139	-.02146	.12006	-1.17874
2.500	4.089	.02082	.11671	.11524	-.02957	-.00126	-.00020	-.00166	.10812	.12426	.87013
2.500	8.138	.02195	.24533	.11377	-.03045	-.00114	-.00043	-.00217	.23372	.14792	1.50379
2.500	12.231	.02288	.38835	.11097	-.04554	-.00105	-.00043	-.00412	.34673	.19057	1.86723
2.500	16.276	.02201	.53566	.10873	-.05670	-.00123	-.00042	-.00720	.46372	.25450	1.90072
2.500	20.413	.02079	.69266	.10568	-.06205	-.00142	-.00020	-.00440	.61249	.34070	1.75774
2.500	24.131	.02245	.85974	.10280	-.07101	-.00125	-.00021	-.00424	.73630	.43043	1.63904
2.500	28.086	.02248	1.03240	.09905	-.08152	-.00144	-.00030	-.00452	.89152	.50159	1.47634
2.500	32.740	.02146	1.21020	.09344	-.09663	-.00180	-.00041	-.00290	.96733	.57344	1.31571

RUN NO. 4/ 0

WACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
4.600	-3.557	.03374	-1.10540	.09149	-.03289	.00005	.00049	-.00421	-.09952	.09785	-1.01704
4.600	-1.588	.03977	-1.06390	.08768	-.03065	.00000	.00005	-.00317	-.06145	.09342	-1.09723
4.600	.442	.04335	-1.02250	.08457	-.03047	-.00005	.00005	-.00474	-.02315	.18439	-2.74331
4.600	2.457	.03395	.01891	.08148	-.03078	-.00009	.00003	-.00269	.01340	.08222	.18725
4.600	4.100	.0317	.06193	.07864	-.03111	-.00031	.00004	-.00509	.05187	.08343	.09370
4.600	8.520	.04248	.15673	.07590	-.03129	-.00033	.00003	-.00517	.15395	.00979	1.54172
4.600	12.531	.04976	.26289	.07219	-.03376	-.00017	.00001	-.00721	.25750	.13545	1.90174
4.600	16.597	.04717	.40730	.07763	-.03333	-.00036	.00001	-.00513	.34332	.15168	1.87116
4.600	20.464	.04674	.54388	.07942	-.03242	-.00021	.00004	-.00497	.49732	.07398	1.81054
4.600	24.722	.04714	.67140	.07212	-.03026	-.00040	.00005	-.00410	.61170	.37224	1.60740
4.600	28.797	.04072	.79780	.06378	-.02222	-.00057	-.00066	-.00491	.72352	.49334	1.46667
4.600	32.837	.04001	1.01460	.06512	-.00799	-.00050	-.00086	-.00546	.93120	.63880	1.30668
4.600	36.890	.04094	1.22793	.06819	-.00753	-.00050	-.00086	-.00370	.92906	.80758	1.15041
4.600	40.955	.04189	1.41115	.06802	-.00680	-.00076	-.00083	-.00440	1.00803	.99145	1.01673

LA49 TABULATED SOURCE DATA

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LA-49 UPMJ 1101 RI-0892/139 ORB SPLIT ELEVON

(RHJ004)

PARAMETRIC DATA

BETA = .000 ELV-LO = .000
 ELV-LI = -40.000 ELV-RI = -40.000
 ELV-RO = .000 BDFLAP = .000
 SPOBRK = 25.000 ELEVR = -40.000
 ALLRON = .000

RUN NO. 23/ 0

MACH	ALPHA	BETA	CN	CA	CLM	CL	CYN	CY	CL	CD	L/D
2.500	-4.072	.02034	-1.0667	.13543	.01386	-.00141	.00021	-.00228	-.17658	.14833	-1.19033
2.500	-1.004	.02113	-.04824	.13293	.00066	-.00114	-.00001	-.00299	-.04823	.13293	-.36281
2.500	4.092	.02137	.09402	.12613	-.01544	-.00094	-.00022	-.00269	.08478	.13252	.63973
2.500	8.130	.02217	.23038	.12167	-.02887	-.00091	-.00044	-.00302	.21106	.13306	1.37897
2.500	12.224	.02240	.37379	.11588	-.03696	-.00109	-.00044	-.00338	.34056	.19338	1.76111
2.500	16.315	.02192	.52105	.11333	-.04687	-.00127	-.00044	-.00216	.46924	.25514	1.83522
2.500	20.435	.02245	.66982	.11512	-.05434	-.00137	-.00044	-.00354	.59953	.34090	1.75963
2.500	24.518	.02228	.84630	.10710	-.06329	-.00126	-.00045	-.00334	.72955	.44964	1.61723
2.500	28.652	.02161	1.01544	.10370	-.07231	-.00157	-.00034	-.00302	.84138	.57789	1.45597
2.500	32.770	.02200	1.19972	.09940	-.08583	-.00166	-.00043	-.00366	.95498	.73295	1.30292

RUN NO. 5/ 0

MACH	ALPHA	BETA	CN	CA	CLM	CL	CYN	CY	CL	CD	L/D
4.800	-3.524	.04072	-1.11664	.09479	-.02612	-.00015	-.00037	-.00455	-.11099	.10178	-1.08661
4.800	-1.576	.04033	-.07530	.09072	-.02997	-.00002	-.00037	-.00353	-.07277	.09276	-.78457
4.800	.453	.04067	-.03007	.08733	-.02643	-.00007	-.00038	-.00498	-.03076	.08709	-.35322
4.800	2.465	.04043	.01531	.08398	-.02688	-.00029	-.00039	-.00382	.01169	.08456	.13819
4.800	4.494	.01997	.06766	.08060	-.02801	-.00030	-.00039	-.00263	.05416	.08511	.63636
4.800	8.534	.04050	.16715	.07699	-.02920	-.00031	-.00002	-.00521	.15388	.10294	1.92439
4.800	12.570	.03980	.26102	.07720	-.03100	-.00018	-.00041	-.00228	.25746	.13660	1.88470
4.800	16.591	.04032	.40652	.07777	-.03329	-.00034	-.00042	-.00420	.36748	.19168	1.91716
4.800	20.636	.04011	.55112	.08187	-.03492	-.00040	-.00043	-.00316	.48691	.27085	1.79767
4.800	24.738	.04038	.70306	.08467	-.03783	-.00060	-.00046	-.00444	.60311	.37111	1.62517
4.800	28.760	.04131	.86050	.08638	-.04616	-.00060	-.00109	-.00531	.71279	.48975	1.45542
4.800	32.826	.04148	1.03721	.08697	-.05351	-.00061	-.00130	-.00581	.82335	.63703	1.29249
4.800	36.901	.04156	1.21673	.09158	-.06370	-.00071	-.00129	-.00617	.91800	.80381	1.14206
4.800	40.958	.04166	1.39242	.09257	-.07463	-.00082	-.00129	-.00660	.99090	.98260	1.00845

LA49 TABULATED SOURCE DATA

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LA-49 UPM 1101 RI-0898/139 CR6 SPLIT ELEVON

(RHJ005)

PARAMETRIC DATA

BETA = .000 ELV-LO = -10.000
 ELV-LI = -10.000 ELV-RI = -10.000
 ELV-RO = -10.000 BDPLAP = .000
 SPOBRK = 25.000 AIRRON = .000
 ELEVTR = -10.000

RUN NO. 24/ 0

WCH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
2.500	-4.060	.06074	-1.14981	.11986	-.00658	-.00140	.00001	-.00204	-.14093	.13016	-1.05287
2.500	-.012	.02047	-.01750	.11707	-.01869	-.00151	-.00021	-.00109	-.01748	.11707	-.14929
2.500	4.065	.02108	.11874	.11472	-.03232	-.00124	-.00043	-.00144	.11031	.12285	.89787
2.500	6.133	.02190	.25140	.11243	-.04058	-.00114	-.00065	-.00205	.23297	.14887	1.58620
2.500	12.213	.02319	.39014	.10980	-.04834	-.00113	-.00065	-.00395	.35908	.18985	1.88617
2.500	16.301	.02236	.53900	.10711	-.05684	-.00113	-.00065	-.00281	.48630	.25381	1.91598
2.500	20.419	.02302	.69353	.10356	-.06268	-.00123	-.00065	-.00440	.61389	.33683	1.81182
2.500	24.530	.02230	.85996	.09996	-.07032	-.00124	-.00044	-.00427	.73911	.44673	1.63227
2.500	28.648	.02210	1.03071	.09489	-.08195	-.00153	-.00032	-.00376	.85904	.57742	1.48773
2.500	32.753	.02144	1.21390	.08937	-.09711	-.00151	-.00041	-.00268	.97147	.73359	1.32427

RUN NO. 6/ 0

WCH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
4.600	-3.540	.04090	-1.10151	.09065	-.03212	-.00012	-.00036	-.00397	-.09572	.09674	-.98947
4.600	-1.569	.04015	-.06395	.08682	-.03062	-.00017	-.00037	-.00398	-.06144	.08454	-.88401
4.600	.445	.04072	-.02234	.08374	-.03112	-.00039	-.00037	-.00480	-.02299	.08356	-.27515
4.600	2.479	.04069	.03229	.08118	-.03089	-.00044	-.00080	-.00340	.01935	.08210	.23574
4.600	4.495	.04026	.06830	.07835	-.03064	-.00066	-.00091	-.00226	.06195	.08349	.74199
4.600	6.541	.04031	.10721	.07532	-.03086	-.00068	-.00040	-.00249	.13417	.09332	1.11223
4.600	12.552	.04019	.28109	.07339	-.03099	-.00035	-.00093	-.00216	.23798	.13468	1.91553
4.600	16.676	.04006	.41080	.07680	-.03391	-.00071	-.00084	-.00399	.37171	.19100	1.94612
4.600	20.681	.04004	.55628	.07329	-.03621	-.00074	-.00065	-.00391	.49131	.23322	1.91919
4.600	24.729	.04000	.70606	.06715	-.03632	-.00075	-.00065	-.00316	.60813	.25131	1.71136
4.600	28.770	.04110	.86338	.06217	-.03615	-.00110	-.00109	-.00493	.72164	.48997	1.47283
4.600	32.846	.04128	1.04431	.05444	-.04094	-.00109	-.00129	-.00531	.83206	.63768	1.30481
4.600	36.881	.04131	1.22843	.04670	-.04777	-.00137	-.00129	-.00553	.93117	.80381	1.15557
4.600	40.981	.04224	1.41165	.04462	-.04741	-.00163	-.00128	-.00618	1.01020	.98966	1.02076

LA49 TABULATED SOURCE DATA

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LA-49 UPM 1101 RI-0898/139 CR8 SPLIT ELEVON

(RHJ006)

PARAMETER DATA

BETA = .000 ELV-LO = -20.000
 ELV-LI = -20.000 ELV-RI = -20.000
 ELV-RO = -20.000 BDPLAP = .000
 SPOBRK = 25.000 AIRLON = .000
 ELVTR = -20.000

RUN NO. 25/ 0

WACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
2.500	-4.052	.02071	-1.1809	.12766	.01138	-.00167	-.00002	-.00192	-.16882	.13993	-1.20306
2.500	-0.018	.02038	-.04184	.12272	-.00108	-.00130	-.00024	-.00089	-.04180	.12273	-.34058
2.500	4.080	.02225	.09842	.11766	-.01611	-.00131	-.00068	-.00245	.08984	.12434	.72259
2.500	8.134	.02297	.23314	.11406	-.02558	-.00129	-.00091	-.00292	.21461	.14997	1.47018
2.500	12.235	.02293	.37010	.11091	-.03404	-.00128	-.00068	-.00352	.33819	.18683	1.81016
2.500	16.317	.02216	.51968	.10816	-.04140	-.00136	-.00068	-.00245	.46432	.24869	1.86788
2.500	20.421	.02283	.67100	.10487	-.04686	-.00139	-.00045	-.00405	.59224	.33240	1.78170
2.500	24.537	.02283	.83314	.10111	-.05199	-.00141	-.00047	-.00408	.71591	.43797	1.63460
2.500	28.652	.02256	1.00272	.09635	-.06066	-.00161	-.00059	-.00373	.83374	.56534	1.47475
2.500	32.750	.02256	1.18320	.09168	-.07277	-.00198	-.00045	-.00439	.94551	.71719	1.31836

RUN NO. 7/ 0

WACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
4.800	-3.344	.04114	-1.1654	.09373	-.02402	-.00030	-.00060	-.00430	-.11033	.10075	-1.09507
4.800	-1.376	.04076	-.07510	.08991	-.02319	-.00021	-.00040	-.00353	-.07260	.09194	-.78963
4.800	.470	.04031	-.02977	.08622	-.02432	-.00042	-.00081	-.00234	-.03047	.08997	-.35446
4.800	2.475	.04086	.01550	.08288	-.02410	-.00047	-.00081	-.00381	.01191	.08347	.14266
4.800	4.471	.04043	.04079	.08006	-.02387	-.00032	-.00082	-.00269	.05432	.08458	.64223
4.800	6.316	.04045	.19971	.07630	-.02445	-.00030	-.00083	-.00278	.14682	.09931	1.47635
4.800	12.555	.02143	.27358	.07653	-.02557	-.00037	-.00126	-.00245	.25040	.13417	1.86635
4.800	18.596	.02120	.39959	.07797	-.02579	-.00037	-.00128	-.00186	.38068	.18886	1.90977
4.800	24.723	.02194	.53999	.08042	-.02540	-.00061	-.00129	-.00358	.47569	.25612	1.70127
4.800	28.769	.02169	.68811	.08223	-.02837	-.00080	-.00132	-.00498	.59065	.36248	1.62941
4.800	32.857	.02194	.84972	.08364	-.03368	-.00098	-.00154	-.00328	.70458	.48227	1.46096
4.800	36.890	.02300	1.01870	.08533	-.04063	-.00100	-.00174	-.00399	.80933	.62452	1.29593
4.800	40.969	.02307	1.19842	.08680	-.05014	-.00128	-.00174	-.00684	.90630	.78865	1.14944
4.800			1.37796	.08843	-.06034	-.00136	-.00174	-.00729	.98379	.96871	1.01557

LA49 TABULATED SOURCE DATA

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LA-49 UPM 1101 RI-0698/139 ORB SPLIT ELEVON

(RHJ007)

PARAMETRIC DATA

BETA = .000 ELV-LO = -40.000
 ELV-LI = -40.000 ELV-RI = -40.000
 ELV-RO = -40.000 BDFAP = .000
 SPOBK = 25.000 AIRON = .000
 ELEVK = -40.000

RUN NO. 28/ 0

MAOH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
2.500	-4.073	.02038	-.21508	.14402	.33137	-.00158	.00018	-.00226	-.20829	.15922	-1.30823
2.500	.002	.02180	-.07267	.13698	.01713	-.00102	.00019	-.00381	-.07267	.13898	-.92291
2.500	4.054	.02145	.06766	.13057	-.00009	-.00110	-.00025	-.00245	.05826	.13503	.43143
2.500	8.138	.02268	.20452	.12893	-.01166	-.00108	-.00024	-.00429	.18449	.15482	1.19318
2.500	12.234	.02196	.34746	.12072	-.01903	-.00097	-.00024	-.00329	.31599	.19161	1.63871
2.500	16.308	.02214	.49290	.11664	-.02750	-.00103	-.00024	-.00360	.44032	.25036	1.79878
2.500	20.430	.02220	.64928	.11216	-.03409	-.00107	-.00024	-.00372	.56835	.33140	1.71501
2.500	24.534	.02351	.81233	.10871	-.03872	-.00147	-.00049	-.00501	.69395	.43621	1.59063
2.500	28.586	.02239	.97873	.10303	-.04519	-.00149	-.00061	-.00342	.80909	.56203	1.43957
2.500	32.755	.02180	1.15439	.10109	-.05599	-.00149	-.00047	-.00294	.91613	.70960	1.29105

RUN NO. 29/ 0

MAOH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
4.600	-3.541	.02568	-.14329	.10878	-.00890	-.00040	-.00548	-.00225	-.13630	.11740	-1.16097
4.600	-1.583	.02131	-.05766	.10326	-.00836	-.00011	-.00125	-.00193	-.09477	.10592	-.89473
4.600	.467	.02180	-.03245	.09781	-.01155	-.00031	-.00125	-.00327	-.05324	.09718	-.54784
4.600	2.463	.02134	-.00712	.09319	-.01337	-.00032	-.00125	-.00206	-.01112	.09279	-.11982
4.600	4.468	.02183	.04178	.08974	-.01518	-.00039	.0126	-.00339	.03474	.03172	.37978
4.600	6.538	.02181	.14450	.08343	-.01640	-.00057	-.00127	-.00337	.13051	.10395	1.25546
4.600	12.569	.02141	.38872	.08264	-.01816	-.00024	-.00127	-.00300	.23799	.13771	1.72813
4.600	16.519	.02141	.58872	.08372	-.01906	-.00061	-.00129	-.00239	.34812	.19106	1.82210
4.600	20.570	.02175	.78879	.08334	-.01966	-.00064	-.00130	-.00149	.46427	.26744	1.73798
4.600	24.724	.02180	.95877	.08005	-.01937	-.00067	-.00133	-.00296	.57762	.36390	1.58733
4.600	28.771	.02201	.93077	.07592	-.02449	-.00086	-.00155	-.00409	.68445	.47956	1.42727
4.600	32.860	.02226	1.00375	.09294	-.02944	-.00088	-.00176	-.00479	.79272	.62269	1.27307
4.600	36.925	.02246	1.17576	.09429	-.03480	-.00100	-.00176	-.00547	.88267	.78255	1.12794
4.600	40.966	.02300	1.35153	.09660	-.04278	-.00111	-.00219	-.00591	.95721	.95903	.68810

LA-49 INPUT 1101 RI-0898/139 CR8 SPLIT ELEVON

(RHJ008)

PARAMETRIC DATA

BETA = .000 ELV-LO = -10.000
 ELV-LI = .000 ELV-RI = .000
 ELV-RO = -10.000 EDPLAP = .000
 SPDRK = 25.000 ELEVTR = -10.000
 AILRON = .000

RUN NO. 27/ 0

WAOH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
2.500	-4.069	.01970	-.13744	.11839	-.01573	-.00155	-.00020	.00004	-.12870	.12784	-1.00666
2.500	-.023	.02139	-.00542	.11789	-.02786	-.00148	-.00043	-.00185	-.00537	.11789	-.04599
2.500	4.062	.02242	.13073	.11637	-.04070	-.00150	-.00067	-.00218	.12216	.12534	.97466
2.500	6.133	.02277	.26532	.11442	-.09006	-.00110	-.00087	-.00274	.24646	.15081	1.63432
2.500	12.251	.02308	.40438	.11191	-.09826	-.00100	-.00067	-.00324	.37143	.19317	1.90312
2.500	16.314	.02316	.55172	.10971	-.08891	-.00127	-.00066	-.00340	.49869	.26028	1.91598
2.500	20.428	.02276	.70958	.10437	-.07664	-.00128	-.00063	-.00347	.62852	.34547	1.81933
2.500	24.522	.02349	.87736	.10287	-.08727	-.00109	-.00064	-.00459	.75553	.45774	1.65056
2.500	28.633	.02253	1.05405	.09831	-.10211	-.00136	-.00052	-.00387	.87904	.59139	1.48472
2.500	32.749	.02274	1.24166	.09543	-.11874	-.00134	-.00060	-.00425	.99266	.75196	1.32011

RUN NO. 9/ 0

WAOH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
4.800	-3.924	.02152	-.09785	.09144	-.03482	-.00011	-.00078	-.00371	-.09204	.09726	-.94616
4.800	-1.561	.02119	-.08015	.08763	-.03263	-.00017	-.00079	-.00284	-.05774	.08924	-.64704
4.800	.464	.02118	-.01880	.08481	-.03314	-.00021	-.00121	-.00171	-.01949	.08465	-.23025
4.800	2.473	.02177	.02281	.08217	-.03232	-.00044	-.00123	-.00328	.01924	.08308	.23162
4.800	4.491	.02131	.06815	.07963	-.03278	-.00048	-.00123	-.00213	.06171	.08472	.72834
4.800	6.524	.02129	.17452	.07673	-.03322	-.00050	-.00124	-.00205	.16122	.10175	1.58444
4.800	12.547	.02154	.28831	.07705	-.03640	-.00016	-.00167	-.00166	.26468	.13784	1.92019
4.800	16.630	.02176	.41006	.07887	-.04076	-.00034	-.00168	-.00277	.37801	.19321	1.93639
4.800	20.667	.02170	.56569	.08151	-.04643	-.00018	-.00168	-.00219	.50052	.27591	1.81404
4.800	24.729	.02208	.72118	.08379	-.05345	-.00019	-.00170	-.00327	.62000	.37780	1.64106
4.800	28.786	.02230	.88620	.08626	-.06312	-.00018	-.00191	-.00391	.73515	.50235	1.46341
4.800	32.831	.02235	1.06634	.08887	-.07932	.00007	-.00210	-.00412	.84784	.65280	1.29876
4.800	36.906	.02229	1.25336	.09119	-.09423	-.00008	-.00209	-.00413	.94745	.82557	1.14764
4.800	40.958	.02317	1.44028	.09244	-.11190	-.00015	-.00208	-.00666	1.02709	1.01391	1.01300



LA49 TABULATED SOURCE DATA

LA-49 UPWT 1101 RI-0008/139 ORB SPLIT ELEVON

PAGE 9

(RHJ009)

PARAMETRIC DATA

BETA = .000 ELV-LO = -20.000
 ELV-LI = .000 ELV-RI = .000
 ELV-RO = -20.000 SDPLAP = .000
 SPOBRK = 25.000 ELVTR = -20.000
 AILRON = .000

RUN NO. 26/ 0

MACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
2.900	-4.073	.02004	-.14747	.12122	-.00913	-.00168	-.00022	-.00042	-.13849	.13138	-1.05408
2.900	-.012	.02170	-.01346	.11961	-.02126	-.00151	-.00044	-.00227	-.01346	.11961	-.11249
2.900	4.052	.02173	.12278	.11763	-.03483	-.00142	-.00098	-.00115	.11416	.12603	.90578
2.900	6.143	.02207	.23703	.11540	-.04491	-.00112	-.00098	-.00171	.23809	.13064	1.96031
2.900	12.222	.02333	.39634	.11269	-.03274	-.00121	-.00098	-.00360	.36390	.19404	1.87331
2.900	16.314	.02253	.54124	.11028	-.02867	-.00120	-.00087	-.00246	.48847	.23788	1.89420
2.900	20.406	.02308	.70082	.10303	-.07053	-.00149	-.00064	-.00392	.62021	.34282	1.80915
2.900	24.533	.02241	.86894	.10337	-.08095	-.00130	-.00042	-.00360	.74740	.43498	1.64272
2.900	28.631	.02296	1.04134	.09874	-.09363	-.00139	-.00033	-.00445	.86670	.58463	1.47993
2.900	32.754	.02320	1.22753	.09608	-.11033	-.00147	-.00062	-.00487	.98037	.74494	1.31603

RUN NO. 10/ 0

MACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
4.600	-3.547	.02207	-.10921	.09361	-.03086	-.00048	-.00121	-.00402	-.10321	.10016	-1.03020
4.600	-1.567	.02170	-.06753	.06893	-.02861	-.00053	-.00122	-.00306	-.06313	.09075	-.71773
4.600	.464	.02127	-.02222	.08382	-.02839	-.00098	-.00123	-.00193	-.02292	.08564	-.26762
4.600	2.481	.02087	.01923	.08289	-.02885	-.00062	-.00123	-.00087	.01563	.08364	.18714
4.600	-1.490	.02141	.06481	.08021	-.02867	-.00067	-.00124	-.00235	.08813	.08502	.69374
4.600	8.526	.02141	.16744	.07716	-.02922	-.00069	-.00123	-.00236	.15415	.10114	1.52415
4.600	12.548	.02163	.28101	.07734	-.03303	-.00092	-.00167	-.00192	.23749	.13655	1.88572
4.600	16.623	.02091	.41449	.07899	-.03660	-.00071	-.00126	-.00113	.37457	.19426	1.92812
4.600	20.663	.02143	.55057	.08133	-.04098	-.00072	-.00127	-.00258	.49396	.27343	1.80682
4.600	24.706	.02225	.71155	.08400	-.04812	-.00073	-.00171	-.00368	.61132	.37372	1.63577
4.600	28.761	.02244	.88092	.08547	-.05837	-.00090	-.00193	-.00425	.73046	.49992	1.46115
4.600	32.831	.02254	1.03771	.08876	-.07056	-.00089	-.00212	-.00459	.84041	.64833	1.29628
4.600	36.891	.02253	1.23906	.09069	-.08402	-.00098	-.00211	-.00474	.93653	.81633	1.14725
4.600	40.972	.02245	1.42602	.09163	-.10031	-.00106	-.00210	-.00470	1.01661	1.00421	1.01234

LA-49 UPMI 1101 RI-0698/199 ORS SPLIT ELEVON

(RHJ010)

PARAMETRIC DATA

BETA = .000 ELV-LO = -40.000
 ELV-LI = .000 ELV-RI = .000
 ELV-RO = -40.000 EDPLAP = .000
 SPOBRK = 25.000 ELEVTR = -40.000
 ATLPCN = .000

RUN NO. 29/ 0

WACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	QL	CD	L/D
2.900	-4.062	.01994	-.16812	.13038	.00287	-.00126	.00022	-.00146	-.15846	.14198	-1.11623
2.900	-.013	.02186	-.02992	.12799	-.01141	-.00127	-.00022	-.00308	-.02989	.12760	-.23425
2.900	4.090	.02146	.10821	.12425	-.02535	-.00090	-.00044	-.00197	.09916	.13158	.75362
2.900	6.134	.02177	.24285	.12070	-.03660	-.00069	-.00043	-.00248	.22333	.13363	1.45156
2.900	12.237	.02299	.36388	.11679	-.04587	-.00068	-.00042	-.00429	.39041	.19551	1.79229
2.900	16.324	.02209	.53346	.11373	-.05576	-.00076	-.00042	-.00303	.47999	.29509	1.83239
2.900	20.410	.02308	.66903	.10821	-.06347	-.00105	-.00042	-.00450	.60806	.34171	1.77946
2.900	24.530	.02337	.85842	.10562	-.07400	-.00105	-.00020	-.00557	.73667	.45339	1.62479
2.900	28.613	.02196	1.03210	.10131	-.08676	-.00123	-.00031	-.00360	.89753	.58320	1.47039
2.900	32.732	.02326	1.21547	.09968	-.10271	-.00103	-.00040	-.00554	.96856	.74107	1.30697

RUN NO. 11/ 0

WACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	QL	CD	L/D
4.800	-3.528	.02102	-.12401	.10423	-.01864	-.00019	-.00081	-.00231	-.11736	.11166	-1.03109
4.800	-1.568	.02082	-.08271	.09922	-.01850	-.00024	-.00081	-.00128	-.07996	.10145	-.78819
4.800	.467	.02154	-.03746	.09396	-.02030	-.00027	-.00124	-.00260	-.03822	.09368	-.40801
4.800	2.679	.02109	.00793	.08981	-.02075	-.00049	-.00124	-.00144	.00404	.09007	.04481
4.800	4.496	.02189	.05709	.08632	-.02189	-.00053	-.00125	-.00278	.09014	.09053	.55385
4.800	6.517	.02158	.11609	.08136	-.02454	-.00071	-.00126	-.00280	.14231	.10358	1.37594
4.800	12.566	.02176	.27775	.08080	-.02832	-.00037	-.00168	-.00219	.25352	.13931	1.81985
4.800	18.589	.02104	.40773	.08199	-.03263	-.00075	-.00127	-.00145	.36735	.19499	1.88392
4.800	20.627	.02106	.51597	.08448	-.03702	-.00057	-.00170	-.00285	.48663	.27386	1.77696
4.800	24.724	.02135	.70791	.08707	-.04334	-.00075	-.00172	-.00793	.62661	.37517	1.61089
4.800	28.759	.02264	.86932	.08980	-.05232	-.00075	-.00193	-.00476	.71915	.49690	1.44727
4.800	32.855	.02173	1.05017	.09215	-.06445	-.00074	-.00213	-.00240	.83220	.64714	1.28597
4.800	36.895	.02270	1.23375	.09308	-.07807	-.00084	-.00212	-.00316	.92929	.81672	1.13819
4.800	40.970	.02263	1.41839	.09643	-.09354	-.00075	-.00211	-.00316	1.00773	1.00280	1.00492

LA-49 UNIT 1101 RI-0098/139 ORR SMPLY ZEVON

(RMJ011)

PARAMETRIC DATA

BETA =	.000	ELV-LO =	.000
ELV-LI =	.000	ELV-RI =	-20.000
ELV-RO =	-20.000	BDFAP =	.000
SPOBCK =	25.000	ALFON =	10.000
ELVTR =	-10.000		

PUN MS. 30/0

[illegible]

12/5

ALPHA	BETA	CN	CA	CLM	ML	CM	Q	CD	L/D
4.557	0.2134	-1.0790	0.276	-0.3114	0.0293	-0.0335	-0.0040	-0.0163	0.0926
-1.594	-0.095	-0.0573	0.093	-0.0456	0.0243	0.0136	-0.0339	0.0327	-0.69746
4.444	-0.095	-0.02464	0.055	-0.0034	0.0203	-0.0079	-0.0024	-0.0477	0.4536
2.498	0.001	0.0244	0.023	-0.0209	0.0181	-0.0079	-0.0108	0.0396	0.21364
4.475	0.001	0.0276	0.013	-0.0056	0.0175	0.0040	-0.0255	0.0029	0.0939
0.0144	0.0039	0.0039	0.031	-0.0302	0.0193	0.0123	-0.0029	0.0110	0.70777
10.906	0.2130	0.0736	0.0736	-0.0061	0.0278	-0.0166	-0.0211	0.0309	1.00495
16.116	0.046	0.0056	0.005	-0.0007	0.0026	-0.0045	-0.0131	0.0347	1.52581
20.643	0.007	0.0009	0.007	-0.0018	0.0009	-0.0016	-0.0054	0.0140	1.80195
24.759	0.0217	0.0173	0.041	-0.0009	0.0009	-0.0011	-0.0103	0.0372	1.63342
28.794	0.0219	0.0330	0.062	-0.0053	0.0061	-0.0023	-0.0053	0.0295	1.46006
32.953	0.0276	0.0473	0.068	-0.0038	0.0030	-0.0023	-0.0037	0.0326	1.02373
36.921	0.0294	0.0294	0.069	-0.0061	0.0043	-0.0029	-0.0042	0.0325	1.14623
40.705	0.027	0.0427	0.06170	-0.00474	0.01073	-0.00333	-0.0027	0.01082	1.07090

(RHJ012)

LA-49 UFWT 1101 RI-0896/139 ORB SPLIT ELEVON

PARAMETRIC DATA

BETA = .000 ELV-LO = -10.000
 ELV-LI = -10.000 ELV-RI = -30.000
 ELV-RO = -30.000 BOFLAP = .000
 SPOERK = 25.000 AIRCON = 10.000
 ELEVR = -20.000

RUN NO. 31/ 0

WACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
2.900	-4.044	.01826	-1.1728	.12661	.00815	.00569	.00439	.00724	-.16318	.14047	-1.18171
2.900	-4.044	.01753	-.03790	.12493	-.00427	.00511	.00325	-.00609	-.03788	.12494	-.30317
2.900	-4.067	.01823	.15303	.12078	-.01892	.00430	.00234	-.00470	.09423	.12777	.1731
2.900	-4.133	.01829	.23586	.11645	-.02893	.00418	.00198	-.00520	.21701	.14865	1.45986
2.900	-12.234	.01894	.37726	.11317	-.03740	.00372	.00119	-.00407	.34471	.19055	1.80907
2.900	-16.320	.01946	.52298	.11016	-.04453	.00363	.00073	-.00292	.47056	.23268	1.86382
2.900	-20.422	.02132	.68036	.10627	-.05172	.00371	.00030	-.00442	.60051	.33699	1.79202
2.900	-24.534	.02133	.84211	.10277	-.05756	.00379	.00048	-.00446	.72341	.44316	1.63239
2.900	-28.623	.02245	1.01104	.09817	-.06703	.00426	-.00009	-.00274	.84746	.57031	1.47318
2.900	-32.765	.02242	1.18474	.09408	-.08032	.00501	-.00018	-.00202	.95374	.72570	1.31423

RUN NO. 13/ 0

WACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
4.900	-4.044	.01753	-1.1537	.09609	-.02243	.00393	.00049	-.00282	-.11320	.10328	-1.00603
4.900	-4.067	.01742	-.03790	.09199	-.02154	.00343	.00048	-.00419	-.07901	.09409	-.70723
4.900	-4.133	.01823	.15303	.08778	-.02282	.00269	.00063	-.00297	-.03252	.08753	-.37148
4.900	-4.133	.01829	.23586	.08443	-.02396	.00213	-.00036	-.00429	.00631	.08478	.07441
4.900	-4.133	.01829	.37726	.08134	-.02346	.00174	-.00039	-.00372	.03295	.08573	.61653
4.900	-12.234	.02243	.52298	.07744	-.02470	.00120	-.00040	-.00308	.14548	.10012	1.45306
4.900	-16.320	.02243	.68036	.07443	-.02511	.00153	-.00126	-.00258	.24931	.13500	1.84668
4.900	-20.422	.02243	.84211	.07079	-.02537	.00151	-.00127	-.00214	.35973	.10018	1.90149
4.900	-24.534	.02243	1.01104	.06717	-.02702	.00193	-.00129	-.00112	.47945	.26777	1.79053
4.900	-28.623	.02243	1.18474	.06348	-.02700	.00233	-.00130	-.00290	.59626	.36636	1.62753
4.900	-32.765	.02243	1.35843	.05983	-.02630	.00301	-.00152	-.00332	.70928	.48669	1.43737
4.900	-36.938	.02251	1.52940	.05712	-.04517	.00398	-.00214	-.00411	.81647	.63133	1.29325
4.900	-40.941	.02251	1.70064	.05478	-.05417	.00447	-.00214	-.00463	.91381	.79813	1.14494
4.900	-44.941	.02263	1.86953	.05276	-.06377	.00541	-.00213	-.00510	.98863	.97637	1.01256

REPRODUCED
 FROM

LA-49 JAWT 1101 H-I-6898/139 CRB SMLTY ELEVON

(RM1013)

PARAMETRIC LAYA

BETA	=	.000	ELV-LO	=	.000
BETA	=	.000	ELV-RI	=	-10.000
BETA	=	.000	PDPLAP	=	.000
BETA	=	.000	ELV-RO	=	-10.000
BETA	=	.000	SPDRK	=	24.000
BETA	=	.000	ELVTP	=	10.000

[illegible]

LA-49 JAN 1 1961 5:39PM 139 CTB SPLIT DEVON

«СЛУЖБА»

PARAMETRIC DATA

[illegible]

1. The first part of the document is a list of names and their corresponding dates. The names are listed in two columns, with the dates listed to the right of each name. The names are: John A. Smith, John B. Smith, John C. Smith, John D. Smith, John E. Smith, John F. Smith, John G. Smith, John H. Smith, John I. Smith, John J. Smith, John K. Smith, John L. Smith, John M. Smith, John N. Smith, John O. Smith, John P. Smith, John Q. Smith, John R. Smith, John S. Smith, John T. Smith, John U. Smith, John V. Smith, John W. Smith, John X. Smith, John Y. Smith, John Z. Smith. The dates are: 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542,

LA-49 UPAT 1101 RI-0898/139 ORB SPLIT ELEVON

(RHJ016)

PARAMETRIC DATA

BETA = .000 ELV-LO = 10.000
 ELV-LI = -20.000 ELV-RI = -20.000
 ELV-RO = -10.000 BDPLAP = .000
 SPOBRK = 25.000 ELEVR = -20.000
 ATLRCN = 10.000

RUN NO. 35/ 0

MACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
2.300	-4.047	.02067	-1.15369	.12521	-.00164	.00140	-.00044	-.00103	-.14447	.13575	-1.06426
2.500	-.017	.02198	-.01961	.12165	-.01338	.00166	-.00089	-.00146	-.01937	.12165	-.16087
2.500	.049	.02196	.11837	.11818	-.02844	.00203	-.00133	-.00029	.10973	.12624	.86922
2.500	8.128	.02407	.25261	.11579	-.03971	.00253	-.00178	-.00218	.23370	.15034	1.55445
2.500	12.235	.02429	.39762	.11330	-.04898	.00301	-.00178	-.00254	.36458	.19499	1.86971
2.500	16.312	.02396	.53997	.11119	-.05862	.00338	-.00200	-.00151	.48700	.25838	1.88489
2.500	20.434	.02533	.70124	.10841	-.06631	.00414	-.00223	-.00292	.61927	.34641	1.78764
2.500	24.535	.02572	.85447	.10542	-.07369	.00498	-.00247	-.00292	.74264	.45487	1.63266
2.500	28.639	.02578	1.03679	.10090	-.08367	.00526	-.00261	-.00244	.86158	.58548	1.47157
2.500	32.751	.02660	1.21993	.09667	-.10015	.00574	-.00313	-.00307	.97369	.74128	1.31353

RUN NO. 17/ 0

MACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
4.000	-3.808	.02248	-.10666	.09361	-.03033	.00109	-.00163	-.00403	-.10056	.10013	-1.00426
4.000	-1.603	.02211	-.06901	.08971	-.02877	.00104	-.00164	-.00304	-.06247	.09149	-.69282
4.000	.475	.02170	-.02364	.08622	-.02998	.00117	-.00164	-.00198	-.02435	.08602	-.28309
4.000	2.437	.02264	.02186	.08347	-.02975	.00095	-.00207	-.00336	.01828	.08433	.21675
4.000	4.433	.02224	.06333	.08072	-.03028	.00107	-.00208	-.00232	.05690	.08538	.66644
4.000	6.437	.02225	.16997	.07773	-.03069	.00198	-.00208	-.00240	.15277	.10124	1.50904
4.000	12.504	.02293	.27976	.07825	-.03343	.00244	-.00294	-.00201	.25618	.13696	1.87044
4.000	16.403	.02369	.40354	.07933	-.03564	.00295	-.00294	-.00406	.36647	.19120	1.91665
4.000	20.958	.02311	.56867	.08355	-.03930	.00397	-.00295	-.00460	.50117	.28143	1.78079
4.000	24.681	.02411	.70890	.08587	-.04390	.00483	-.00339	-.00418	.60828	.37404	1.62625
4.000	28.632	.02484	.87018	.08795	-.04938	.00569	-.00402	-.00506	.72145	.49442	1.45919
4.000	32.885	.02537	1.05043	.09099	-.06315	.00637	-.00465	-.00544	.83316	.64612	1.28949
4.000	36.844	.02549	1.23036	.09279	-.07344	.00698	-.00464	-.00589	.92898	.81203	1.14403
4.000	41.541	.02607	1.43615	.09314	-.08862	.00742	-.00546	-.00538	1.01316	1.02210	.99125

LA-49 UPWT 1101 RI-0890/139 ORB SPLIT ELEVON

(RHJ017)

PARAMETRIC DATA

BETA = .000 ELV-LO = 10.000
 ELV-LI = -40.000 ELV-RI = -40.000
 ELV-RO = -10.000 BDFLAP = .000
 SPOBRK = 25.000 ELEVTR = -40.000
 ALLRON = 10.000

RUN NO. 36/ 0

MACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
2.500	-4.061	.02102	-1.16425	.13652	.01361	.00151	-.00001	-.00240	-.17407	.14928	-1.16905
2.500	-.012	.02101	-.04410	.13429	.00046	.00178	-.00045	-.00123	-.04407	.13430	-.32815
2.500	4.070	.02183	.09803	.12779	-.01876	.00207	-.00089	-.00128	.09869	.13442	.65975
2.500	8.141	.02282	.23813	.12351	-.02979	.00267	-.00134	-.00155	.21824	.15599	1.39906
2.500	12.234	.02347	.38075	.11893	-.03545	.00325	-.00156	-.00193	.34690	.19691	1.76168
2.500	16.324	.02440	.52995	.11563	-.04306	.00373	-.00201	-.00211	.47608	.25993	1.83162
2.500	20.430	.02575	.69091	.11267	-.05373	.00420	-.00224	-.00347	.60812	.34676	1.75374
2.500	24.533	.02707	.85456	.10972	-.06631	.00466	-.00248	-.00338	.73186	.45464	1.60975
2.500	28.666	.02825	1.02533	.10649	-.07816	.00531	-.00293	-.00308	.84957	.58929	1.44983
2.500	32.759	.02619	1.20471	.10247	-.08920	.00570	-.00315	-.00244	.95766	.73804	1.28759

RUN NO. 18/ 0

MACH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
4.000	-3.543	.02267	-1.11803	.09456	-.02494	.00106	-.00164	-.00449	-.11184	.10367	-1.07878
4.000	-1.615	.02229	-.07634	.09253	-.02340	.00101	-.00165	-.00350	-.07370	.09464	-.77876
4.000	.420	.02184	-.03096	.08864	-.02455	.00097	-.00165	-.00233	-.03161	.08861	-.35673
4.000	2.337	.02280	.01052	.08565	-.02577	.00093	-.00208	-.00378	.00702	.08600	.08166
4.000	4.742	.02231	.09959	.08211	-.02757	.00106	-.00206	-.00251	.03305	.08648	.61343
4.000	6.536	.02230	.16995	.07867	-.02812	.00174	-.00209	-.00251	.15243	.10243	1.48808
4.000	12.569	.02263	.27612	.07898	-.02933	.00242	-.00232	-.00232	.25251	.13718	1.83930
4.000	16.491	.02333	.40570	.08090	-.03306	.00294	-.00253	-.00423	.36605	.19274	1.89923
4.000	20.728	.02328	.55737	.08432	-.03534	.00395	-.00296	-.00301	.49138	.27633	1.78825
4.000	24.709	.02422	.76310	.08790	-.03913	.00498	-.00340	-.00446	.60394	.37450	1.61239
4.000	28.458	.02498	.88262	.09008	-.04755	.00567	-.00403	-.00543	.71306	.49373	1.44424
4.000	33.023	.02551	1.04669	.09320	-.05626	.00654	-.00466	-.00577	.82681	.64857	1.27482
4.000	37.030	.02603	1.22659	.09622	-.06516	.00695	-.00508	-.00619	.92127	.81551	1.12969
4.000	41.135	.02694	1.40611	.09771	-.07614	.00754	-.00590	-.00657	.99480	.99862	.99617

LA49 TABULATED SOURCE DATA

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LA 49 UPWT 1101 RI-C528/139 ORB SPLIT ELEVON

(RHJ018)

PARAMETRIC DATA

BETA = .000 ELV-LO = -20.000
 ELV-LI = -30.000 ELV-FI = -30.000
 ELV-RO = -40.000 BDFLAP = .000
 SPOBPK = 25.000 ELVIR = -30.000
 ATURON = 10.000

RUN NO. 37/0

WAOH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
2.500	-4.060	.01765	-.20014	.13741	.02461	.00127	.00112	-.00034	-.18991	.15123	-1.25573
2.500	-1.001	.01453	-.09980	.13309	.01004	.00089	.00068	-.00066	-.05980	.13309	-.44784
2.500	4.055	.11903	.08252	.12711	-.00496	.00136	.00046	-.00085	.07334	.13262	.55295
2.500	8.150	.01997	.21922	.12275	-.01634	.00139	.00070	-.00274	.19961	.15257	1.30529
2.500	12.229	.02051	.36097	.11658	-.02465	.00084	.00047	-.00306	.32809	.19039	1.72324
2.500	16.322	.02105	.50824	.11296	-.03381	.00038	.00024	-.00329	.45410	.25067	1.81151
2.500	20.432	.02171	.65405	.10960	-.03991	.00046	.00046	-.00489	.58399	.33452	1.74574
2.500	24.572	.02153	.82543	.10543	-.04501	-.00012	.00044	-.00479	.70714	.43864	1.61214
2.500	28.643	.02133	.99262	.10149	-.05189	.00014	-.00013	-.00515	.82250	.56488	1.45606
2.500	32.766	.02099	1.17318	.09686	-.05370	.00024	.00023	-.00536	.93409	.71639	1.30350

RUN NO. 19/0

WAOH	ALPHA	BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	L/D
4.600	-3.040	.02000	-.12557	.10137	-.01416	.00309	.00048	-.00303	-.12063	.10456	-1.11114
4.600	-1.501	.02041	-.06463	.09732	-.01408	.00288	.00047	-.00460	-.09605	.09961	-.86388
4.600	.386	.02055	-.04664	.09280	-.01990	.00215	.00004	-.00343	-.04726	.09248	-.91104
4.600	2.592	.02141	.00279	.08823	-.01762	.00138	-.00039	-.00452	-.00120	.08429	-.01361
4.600	4.560	.02154	.00071	.08442	-.01871	.00137	-.00040	-.00334	.04533	.08430	.51339
4.600	6.542	.02159	.15172	.07981	-.01857	.00083	-.00083	-.00334	.13818	.10146	1.36195
4.600	12.790	.02159	.27016	.07032	-.02024	.00064	-.00127	-.00285	.24592	.13722	1.73215
4.600	14.564	.02148	.36132	.06063	-.02006	.00027	-.00129	-.00326	.34315	.18479	1.95097
4.600	20.773	.02074	.53362	.04324	-.01876	.00023	-.00130	-.00411	.47001	.26662	1.76294
4.600	24.116	.02054	.68732	.03577	-.02176	.00021	-.00176	-.00344	.53338	.36413	1.60213
4.600	29.896	.02299	.84442	.02712	-.02662	.00019	-.00156	-.00649	.69719	.48431	1.43957
4.600	32.792	.02266	1.00640	.02042	-.03213	.00035	-.00218	-.00477	.78759	.62023	1.28593
4.600	36.900	.02337	1.18657	.01433	-.03962	.00041	-.00176	-.00793	.89399	.78355	1.13804
4.600	41.759	.02316	1.39654	.00959	-.04959	.00066	-.00176	-.00761	.98109	.98808	.98298